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THE AUTOMOBILE

FRANCE & SPAIN

Down Through the Basque Country

By FRANCIS MILTOUN

DOWN through Poitou, in mid-France, and on across the barren Landes runs the great Route d'Espagne, along which journeyed Louis XIV when he was on his way to wed the Spanish Infanta Marie-Thérèse at Saint Jean de Luz in 1660, and along which many a stirring automobile race has since been held. The last of racing or touring tests over unguarded roads was held here only last summer, when five lost their lives in the Coupe de la Presse touring competition, which degenerated into a race, and the Government stepped in and stopped it. It was the same fate which befell those of the famous Paris-Madrid race of 1903, when Gabriel's Mors, from Paris to Bordeaux, first broke the sixty-mile-an-hour record for travel by road.

As one has made his way gently or rapidly, down through that marvellously opulent region of mid-France south of the Loire, and has left Tours, Chattellrault, and Poitiers behind, a while new panorama of scenic sensations awaits him. At Libourne, thirty kilometres north of Bordeaux, he has crossed the imaginary line which limits the frontiers of the north and the south, the region of the *vins du table* and the *vins de marque*. From thence his way lies through a country entirely southern in aspect, where, if the leaves do fall from the trees once with the round of the seasons, there is a mildness of atmosphere and an easy manner of living very different from that which holds good in the northern parts of France.

Bordeaux is the obvious and natural stopping place on the way south, and since a wide detour has to be made just south of here, to avoid the awful granite blocks of the times of the Henris and the Louis which still project above ground for a matter of some eighty kilometers, the city may well be reckoned the actual gateway to the much vaunted Côte d'Argent.

Now almost as celebrated as the Côte d'Azur of the Riviera, this fascinating strip of Atlantic coast-line, lying under the shelter of the western Pyrenees and loping over into Spain, has a winter season of quite six months duration, and indeed what the hotel proprietors and the railway managers call an all year round clientele, for it is one of those regions where it is, relatively, warm in winter and waffed by refreshingly cool breezes in summer.

For the six months, from October to May, the elite of all Europe makes gay in the resorts of Biarritz and San Sebastian, and another element takes things easier in Saint Jean De Luz or Cambo.

Automobilists from afar come and go in steady streams all through the year all up and down the Côte d'Argent, over into Spain, and up into the higher valleys of the Pyrenees. There is another group of devotees which makes its headquarters at Pau, but there things are more orthodox and conventional, and there is not the brilliancy and variety of life and atmosphere that is to be had from the cosmopolitanism of Biarritz and the in-

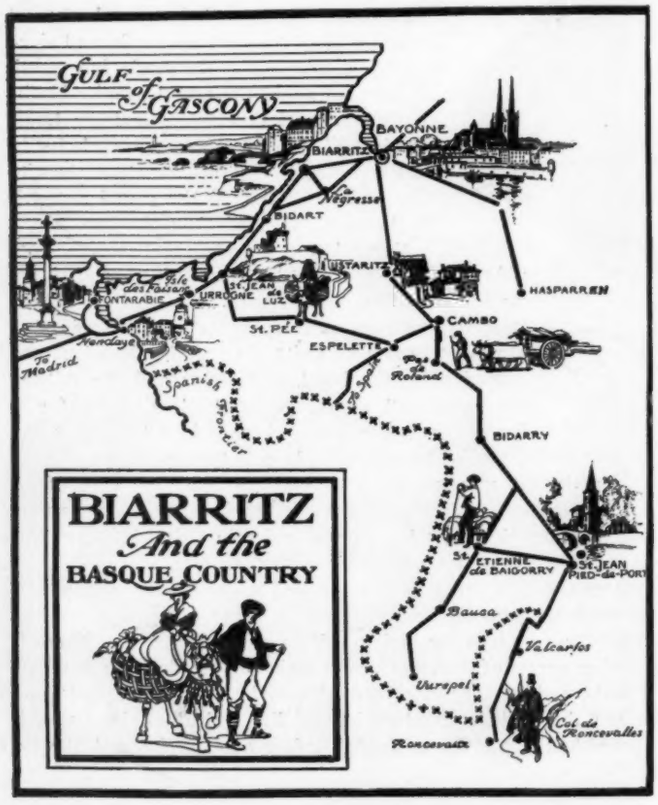
THE APPROACH TO FONTARABIA.

timacy of the rolling billows of the Gulf of Gascony as they pile upon that strip of coast-line bight, extending from the mouth of the Gironde around the Santander in Spain, and so dreaded of sailormen.

Biarritz, in a way, is like any other great European watering place, crowded with great hotels. the inevitable Casino (two of them here, one a municipal enterprise and the other a "concession"), "the game," and all the social divertissements of a cosmopolitan whirl of humanity. Added to this are the not important attractions of nature, the sea and sky, a wonderful panoramic background of the purple Pyrenees, and a fascinating melange of men and manners.

The fame of Biarritz is of the epoch of the third Napoleonic era, when the ambitious Eugénie gave it the cachet of her favor and compelled that of her indifferent spouse. It was only, however, when the Russians, the Americans, and the English came—and the automobile, that Biarritz took on its entirely modern aspect. Finally a batch of grand dukes moved over from Cannes, and England's king put in a season here, and the young Alphonso began to vibrate—on an automobile—between here and San Sebastian and the Palace Miramir that all the world and his wife began to turn their thought to this pearl of Atlantic sea-coast resorts.

Biarritz, then, is the objective south of Bordeaux of all up-to-date automobilists, and as an itinerary for getting south the Route d'Espagne, leaving Paris by the Porte Maillot, Suresnes, Versailles, Rambouillet, Chartres, and Chateaudun is a pleasant change from that usually followed down through the Rhone valley. Incidentally, if one is bound for Monte Carlo—and won't be headed off by counter attractions—there is a matter of five hundred kilometers to be covered over the marvelous lower roads of the Pyrenees—practicable even in winter—there are no snows here of the kind one finds in Switzerland, Dauphiné or Savoie—to link up the waters of Biscay's Bay with those of the Mediterranean.



From Bordeaux to Bayonne is a matter of 180 kilometers by an alternate paved and macadamized road, but the detour via Mont de Marsan and Dax—263 kilometers—is far preferable in spite of its increased length. In good old monarchical days they put down granite paving blocks to improve the going; to-day they are digging them up or burying them under macadam for the same reason. This shows the necessitous needs of modern travel, of the automobile as compared with slow-going iron-tired vehicles of yesterday, with the balance in favor of the auto.

This vast barren plain south of Bordeaux, called the Landes, has always lived in a state of semi-obscurity so far as general public knowledge of it is concerned. One knew it as a grazing ground for sheep and that there were turpentine and resin forests there, but not much more, except that it was peopled by shepherds on stilts which themselves were so weird in their pictured forms as to seem almost unreal.

The roads of the Landes are bad, and have always been bad, because there is no sufficient quantity of decent road-making material at hand to make them better. Things are improving and road-builders are learning more and more every day, though one does wonder, when he comes to think of it, if we have advanced so much over the Romans after all.

At any rate road-building was costly and difficult here in the Landes; it was even so when the Kings of Navarre paved that awful strip of road south of Bazas on the direct route to Bayonne, which remains to-day as the supreme terror of the automobilists in France.

Bayonne One of France's Historic Old Towns.

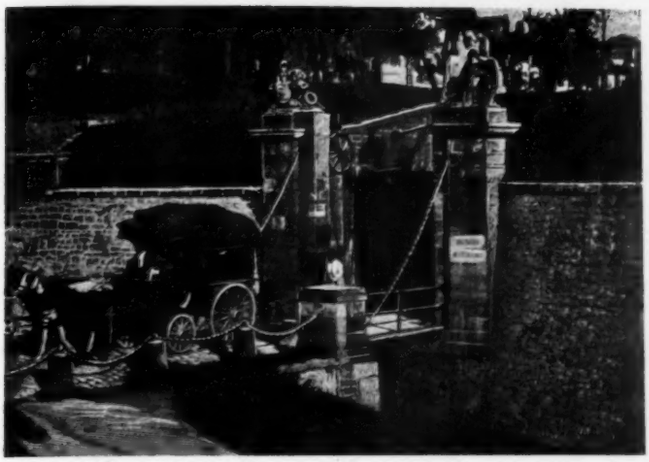
Bayonne is one of the most historic and attractive old towns of France, though it has a busy work-a-day temperament, with not a suspicion of the characteristics of Biarritz, its mondaine neighbor. The artist, the genuine vagabond tourist, and some others will like Bayonne immensely. The hotels are good, but frankly of the quality known as commercial, but they give you the real things of the country to eat and good pure wine to drink and charge you very little for it—and nothing for garaging your automobile. At Biarritz, and in all resorts, one eats imitation Parisian plats, drinks poorer wine—but with an etiquette on the bottle—and pays seventeen prices for everything. *Chacun à son gout!*

The Grand Hotel de Commerce at Bayonne, or the less expensive but better and much more picturesquely named Panier-Fleuri will do you very well, and you will eat of the famous jambon de Bayonne and wonder why you have not heard of these pork products before. The folk of Bayonne don't know how to advertise, that's all; those of Chicago do!

Biarritz is thirteen kilometers from Bayonne; its charms are many; they are all written up in the guide-books, the hotel advertisements and the railway time-tables; you go there and you take your choice of the great palace hotels, and you play the "little horses" for all you are worth—or at least more than you can afford—and you take tea on the terrace and cocktails in the American bar—which is usually presided over by a German named Heinrich, and anything else that you like that you might do so well in New York, Paris, or Vienna—all the distracting things which amuse a blaze whirl. Biarritz is an admirable centre for "something different" in automobile excursions, some of which are set forth in the accompanying sketch-map.

In the Country of the Basques.

One launches out on his automobile from Biarritz and within a few turns of the wheels is in the midst of the country of the Basques, a well-defined region which extends over into Spain,



FORTIFICATION GATEWAYS OF OLD BAYONNE.

but whose people—whether in France or Spain—speak the same unique tongue, which resembles nothing else coming from the mouth of man. The béret of the French Basque is blue, and that of his Spanish brother red; that's the only difference; they both look as though they had stepped out of a comic-opera chorus—though the women are rather more beautiful and for the most part not so aged—and they have a cloak thrown over their shoulders and rope-soled shoes—which they call *espadrilles*—on their feet.

The Basques still obey the laws, speak the tongue, and perform the acts and rites of their ancient civilization—that which perhaps existed three thousand years gone by. In the high Pyrenees, behind their mountain ramparts, they have found the way to resist the march of progress and of many of the jealousies and crimes attendant upon an advanced civilization. A wonderful people, truly!

Leaving Biarritz, on the Route d'Espagne, within eight or ten kilometers one passes the two typical little Basque towns of Bidart and Guetary, with nothing much to remark save the severe primitiveness and cleanliness of the white-walled and red-roofed houses, the charming background panoramas, the off-shore fishing-boats, and the rolling breakers of the sea.

At Saint Jean de Luz, not more than a dozen kilometers from Biarritz, one comes upon something a good deal more characteristic of the *pays* than anything to be seen or experienced in the resort of rank and fashion left behind. The town has developed into a resort, too, of a considerable magnitude, but it has not become fashionable, and hence has some saving grace left. It was the former capital of the country of the French Basques, or at least shared that honor with Saint Jean Pied de Port farther inland. Eleanore of Guyenne brought the town as a part of her marriage dot to Henry Plantagenet in the twelfth century, and reminders of that time are not wanting in this decaying little seaport to-day. History lent a still greater luster to the little Basque metropolis when Louis XIV came here to meet and marry the Spanish princess who was to be his bride in 1660. Then came the decadence. The Basques had always been great whale fishers, and they followed the whales, which had hitherto been numerous in the home waters, to the southern seas, to the Newfoundland Banks and to all ends of the globe, when, suddenly, these hardy mariners developed a roving spirit and a desire to emigrate like the sunny Sicilians and fighting Patrick of to-day. To-day there are more Basques in the Argentine than there are in France, and they are still on the go.

On Towards the Spanish Frontier.

On towards the Spanish frontier another half a dozen kilometers brings one to Urrugune, famous principally because of its clock-tower and some verses which Victor Hugo wrote about it. The tower still bears the following bloodthirsty inscription, but what the exact significance of it is no one seems to know: "Vulnerat Omnes, Ultima Necat." The town, as might be expected, is thoroughly Basque in every crazy, crooked street, and though it has three thousand inhabitants not one of them cares a jot what is happening at Paris and much less what is going on between America and Japan; indeed the only city in America of which they have ever heard is Buenos Ayres, and that only because one or another of them has a relative there.

To Hendaye and the frontier is only another *petit pas*, six or seven kilometers. Hendaye, as a matter of fact, is the railway frontier station; the frontier station by road is at Behobie, at the French end of the Pont International, where, if you are going into Spain, to Fontarabia and San Sebastian, you will have to arrange your custom formalities. These look formidable when set out on the poster tacked up in the Bureau, but they are really quite simple. If you anticipate any trouble the local garage proprietor at Behobie or Saint Jean de Luz will—for a price—relieve you of all annoyance, and may perhaps be induced to guarantee the duties if you are only going across to San Sebastian for a day or two. This is worth looking into. The name of this amiable Frenchman is Claverie, and his address is simply Behobie or Saint Jean de Luz. The Spanish government holds back six pesetas of the sum you advance for customs duties, to pay for the wear and tear on Spanish roads, but since their highways in the immediate vicinity of the frontier are as good as they are across the border no one will quarrel. The farther inland into Spain you go the worse they get, though.

Fontarabia lies four kilometers towards the coast from Irun, the first Spanish town after you have crossed the bridge. Here no one knows French—not even your kind—and is obliged himself to have an interpreter to make himself understood if he takes a ten-mile journey into France and accosts a gendarme by the way. With the indigenous Basque the case is different. A Basque living fifty miles over the border in either country talks

UNCLASSED—BUT GOOD—ROAD IN THE BASQUE COUNTRY.

the same speech as his alien brother, though one knows not French nor the other Spanish. The Basques may be a dying race, but they are holding on to the remnants of their mother tongue with a remarkable pertinacity.

Irun is nothing for the tourist; Fontarabia is much. The latter is a mossy, decaying bit of medievalism living to-day and as notable an example as one will find in Europe close by a great international thoroughfare. Fontarabia is very, very unworldly. It has nine thousand inhabitants, but it doesn't look it, and most of them are dozing away in the shadow of grim-barred windowed and red-roofed Renaissance houses in utter indifference that certain progressive ones are trying to create a resort.

San Sebastian is twenty kilometers beyond Irun. It is the fashionable watering-place of Spain. One can get but little information in France concerning it, but the Spaniards themselves think that it overshadows Biarritz by far. Well, perhaps it does! One is free to take his choice. Anyway there are great hotels here, and the cuisine is French, and accordingly better than if it were Spanish, and there are fine esplanades and shady promenades and bullfights and gambling. Anything you like!

In the Heart of the Western Pyrenees.

Doubling back to Saint Jean de Luz and then turning sharp to the right, one follows the valley of the Nivelle as it flows down from its cradle in the upper Pyrenees. It is the very ideal of a swift-flowing little mountain river and the road is delightful from more points of view than one. All the while one is burrowing into the heart of the Western Pyrenees, the great purple curtain always at a respectable distance, but still so near that one almost feels as if he were already mountain climbing with his automobile. The road is rising all the time, but the slope is so gentle that it is almost imperceptible.

Saint Pée is the first townlet of note on this little byroad. It is thoroughly of another world and era, as is suggested by the ruins of its fifteenth century chateau, where legend has placed sorceries and crimes unspeakable as the chief events which passed within its walls. To-day the little town sleeps its time away, and not a Basque among its inhabitants but what believes that he is as his forefathers.

One of the half dozen practicable carriage roads across the Pyrenees leads into Spain nearby, and if one is so minded he can keep on to Pampelune, the old capital of Spanish Navarre, a mountain town of thirty thousand folk almost as dead as Saint Pée, but not quite. Here the *hotels* and *auberges* have become *posadas*, and the populace spends most of its waking hours in doing nothing save dancing and smoking very black tobacco twisted into slim papillotes. Pampelune is famous for its bull fights and its cathedral, with the bulk of local interest lying with the bull-ring, where the real, unadulterated, simon-pure, non-society bull fight of classic quality takes place as often as the exploiter of the plaza-toro can get an audience together.

One can make the round from Saint Pée to Pampelune and back again into France by another road to Saint Jean Pied de Port, in all perhaps sixty kilometers. The only difficulty will be the arranging of the customs duties, which will have to be done at either Saint Jean de Luz or Saint Jean Pied de Port.

Omitting this little detour into Spain, the road still continues a gentle rise and fall, via Espalette, a Basque market town, where three or four delightfully simple but excellent little hotels will cater for your hunger and fatigue.

From Espalette into the valley of the Nive, a more ambitious sister of the Nivelle, is scarce ten kilometers. One strikes the shores of the Nive at the very spot where the Paladin Roland clove a pathway in the rocky wall which barred his progress when he was fighting for Charlemagne in the eighth century. You need not believe the tale if you don't wish to, but the roads run through a cleft in the rock just the same, and the cleft was made either by the hand of man or God at some period posterior to the time when the rocks were dumped down here.

The road by the Nive continues straight on for thirty-three kilometers to Saint Jean Pied de Port, the metropolis of the inland Basque country, and the rival of Saint Jean de Luz for political honors in times past. The contrast between the two Saint Jeans is very great. At the seaside ville there is an air of antiquity well blended with that of modernity, but at the mountain town all is medieval, even to-day. Its very name, Saint Jean Pied de Port, indicates that it was an advance post of warring times, when the frontier roads in and out of France were even more closely guarded than they are to-day.

Saint Jean Pied de Port's old houses, its frowning citadelle—still a frowning fortress ready garrisoned for anything likely to happen—and its old gates and bridges are other attractions which place the little Pyrenean town in a class quite by itself. The hotels, too, particularly the Hotel Appesteguy—which you had best write down and not try to pronounce when asking your way—being particularly so.

The classic excursion to be made from Saint Jean Pied de Port is up to the crest of the Pyrenees, to the famous Col de Roncevaux, thirty kilometers, and all up hill. It is quite worth the doing, though again there are the annoying customs formalities to be gone through, as shortly after leaving the town the highway enters upon Spanish territory. Perhaps the mechanician at Saint Jean will have a suggestion to make. Better ask him. If the thing doesn't look otherwise practical why hire a hack, which you may do for a matter of fifty francs, but be sure you make the arrangement *"tout compris,"* otherwise you will have surprises sprung upon you—*every little while.*

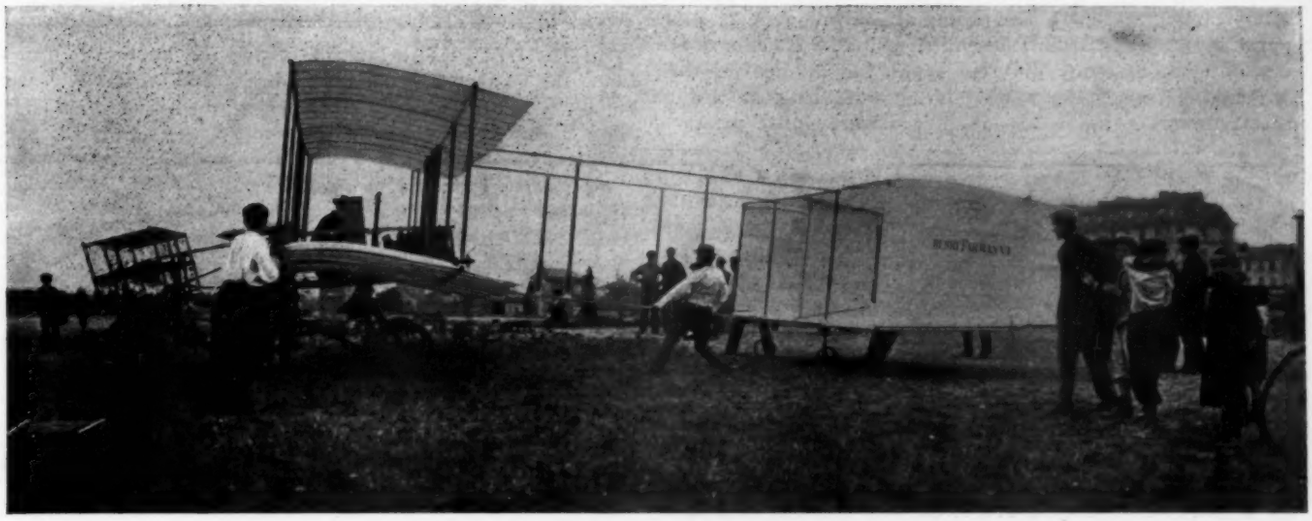
Where Roland Met His Defeat.

The pass is reached—the col or port, according as to whether you ask a Frenchman or a Spaniard—at thirty kilometers, and two kilometers farther on is Roncevaux itself, revered in the memories of our school days when we had to declaim the famous Song of Roland without having the slightest idea of what it was all about, or whether its *locale* ever existed or not. This is the place; here Roland met defeat and Charlemagne's army beat a quick retreat, and all because some credulous Basques would not understand and rolled great bowlders down upon them from above.

The great convent of Roncevaux, perched high on the mountain top, has played its part, too, in the history and romance of France and Spain. After Jerusalem, Rome and Saint James of Compestello, Roncevaux comes next as a place of pious pilgrimage. It suffices to ring the bell at the great gate when a long-robed brother will put in an appearance and do the honors.

Facing north again there is that long down-hill road, thirty odd kilometers to Saint Jean Pied de Port and another thirty odd to Cambo, an incipient and altogether lovely little resort where one may take his ease and rest, and get in touch with civilization in the shape of the New York-Paris *Herald* and yellow-backed novels. Cambo is not yet spoiled, but it is getting that way. It has two thousand inhabitants, five hotels, and no end of villas and furnished apartments. This is enough to weigh down the charms of paradise. Still Cambo is really a delightful green and white little town bedded snugly on the banks of the Nive, a very clean, well-ordered little town, and not at all "rapid," nor even conventional. The Etablissement de Bains is the chief attraction and amusement—for those who can get pleasure out of bathing and talking about one's imaginary ills to the house doctor. The automobilist bathes to a purpose, but most of the frequenters of the *villes d'eau* take baths because they don't know what else to do. Actually the popular fame of Campo to-day is due to the presence of Edmond Rostand. He came after he had made his fame with the rollicking Cyrano, and now the crowds come to worship at the very modern literary shrine offered by his house and grounds.

Back from Cambo to Biarritz and Bayonne is only a good twenty kilometers, the sea air blowing fresh off the Bay of Biscay the while and cooling down the whole region in a way that makes it delightful at any time of the year. Yes, Biarritz is a great resort and its attractions are many, but those of the town, the plage, the great hotels or *"les jeux,"* are not the greatest.



HENRY FARMAN'S AEROPLANE PREPARING FOR A PRACTICE FLIGHT AT THE ISSY-LES-MOULINEAUX DRILL GROUND NEAR PARIS.

FARMAN WINS $10,000 PRIZE FOR KILOMETER FLIGHT

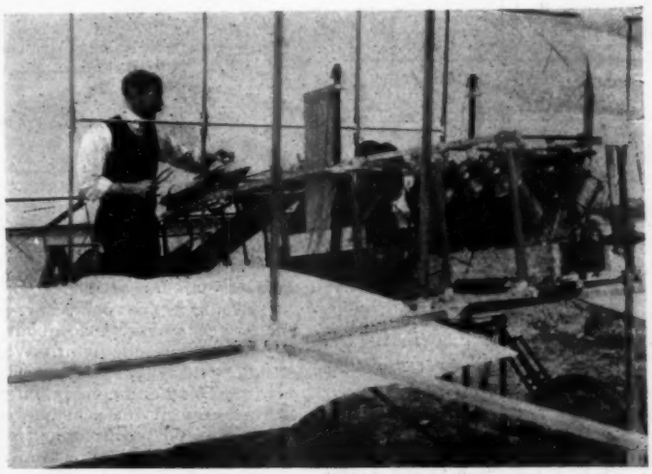
PARIS, Jan. 13.—To Henry Farman, ex-racing cyclist and pioneer automobilist, belongs the honor of first covering a circular kilometer with a flying machine, unsustained by any gas bag, in the presence of experts and under the eyes of the public. Farman this morning won the $10,000 prize offered in October, 1904, by Messrs. Archdeacon and Deutsch de La Meurthe for the first aeroplane covering a circle of not less than one kilometer without touching ground. His victory was clear and decisive, left not a shadow of a doubt and proved to the world that the problem of aerial navigation by machines of the heavier-than-the-air type has been satisfactorily solved.

On the Issy-les-Moulineaux drill ground, just outside the city walls, Farman made two flights on Saturday morning of so successful a nature that he officially engaged himself for the Deutsch-Archdeacon prize this morning and convoked the presence of the Aero Club committee.

At 9:30 of a clear January morning in a still atmosphere and under a sun just sufficiently warm to drive away the early mists, a course was measured out by the Aero Club officials, and preparations made for holding the world's first successful heavier-than-air flying machine contest. A score of prominent aeronauts, among them Santos-Dumont, Bleriot, Comte de la Vaulx and Kapferer had gathered on the ground to watch the attempted record flight. The public, driven off the open field by officious policemen, climbed onto the fortifications, about five hundred strong, where they obtained a better view of the proceedings than the privileged ones on the ground below.

At ten o'clock the eight-cylinder Antoinette motor was cranked, Farman mounted into his seat, and a preliminary run over the ground was commenced. When a hundred yards had been covered and the machine was going 35 miles an hour, Farman lifted the head of his aeroplane and rose gracefully into the air, passing the starting mark at a height of 25 feet from the ground. With no other sound than the noise of the engine and the whir of the big machine. Farman rushed down the straightaway, gradually turning, then swept round the flag on an even keel and in magnificent style. As he straightened out and came down the straight stretch towards the starting point, a realization of victory came over the public and a rousing cheer went up from the crowds on the fortifications. Farman swept past the flags denoting the start and finish at a height of fifteen feet from the ground, cut out his ignition and descended gracefully almost at the feet of the litlte group of officials. No one asked if he had won—it was patent to all. Accounting for the curves, Farman had actually covered 1,300 meters, as subsequent measurement proved.

Kapferer, who had been holding the watch, yelled out: "One minute twenty-eight seconds," the time of the flight; then the Gallic temperament let itself loose, Farman was torn from his machine, carried in triumph, kissed on both cheeks, and cheered again and again. The only person on the ground who maintained his *sang froid* was the hero of the hour. No victory was more deserved than that of Henry Farman. Since receiving the machine built for him by the Voisin Freres, he has perseveringly and persistently trained himself to fly, modifying the machine where necessary, but always declaring that as much depended on the man as the apparatus.



FARMAN AND HIS LIGHT WEIGHT ANTOINETTE ENGINE.

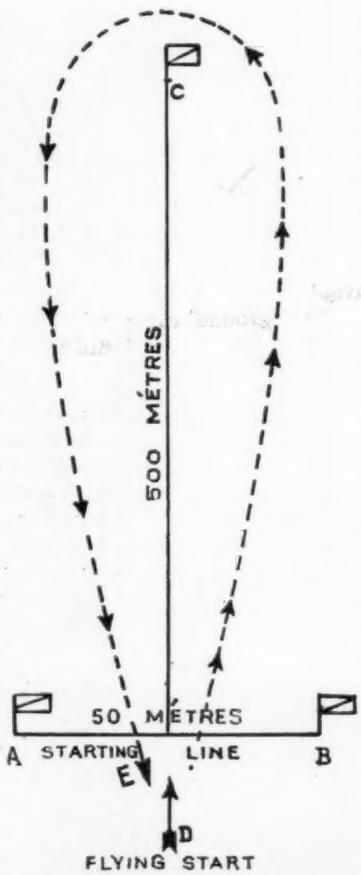
Severity of Kilometer Test.

PARIS, Jan. 6.—For several months fifty thousand francs in crisp bank notes have been waiting to be handed over for one minute's work in the air, without a person on the face of the globe being able to lay claim to them. Flying a kilometer in a circle, so glibly spoken of by everybody interested in aeronautics, is a more difficult problem than is generally supposed, and means far more

than leaving the earth and dropping down again at some point 1,093 yards from the starting line. Half a dozen machines, of as many different types, but all heavier than air, have succeeded in doing this without being entitled to special mention, much less a ten thousand dollar prize.

When M. Archdeacon's cash has been won, as it certainly will be at no very distant date, it will prove that a new and practical era in aerial locomotion has been inaugurated for the initial difficulties connected with sustentation, steering and alighting will have been solved. What the contest committee of the Aero Club of France, which has charge of the test, expects of the aeronaut is shown by the accompanying sketch. The aeronaut having been given as long a run as he desires, must leave the ground at the line *AB*, swing round the flag *C*, situated 500 meters ahead, and return to the starting point without having touched earth. Further, he must come down at the exact point from which he left the ground, or if unable to do this must drop some object in his passage which shall fall within a circle of 26 yards around that point. The starting line *AB* is not a fixed one, but a flying line, if one may use such an expression, noted by the referees called to watch the test. Likewise the flag *C* only exists after the test has been made, the aeronaut being obliged therefore to judge the distance covered before attempting to make the turn, the jury noting the point farthest away from the starting line and measuring afterwards.

The chief difficulty of the test is the turn after covering half the distance. Naturally the machines keep as close to the surface of the earth as possible, to guard against accidents, but when low there is constant danger of one of the wheels touching as the machine heels over and causing disqualification. Lack of equilibrium, too, is frequently a cause of failure, a machine which can travel successfully on the straight being incapable of being driven in a circle.



THE COURSE COVERED BY FARMAN.

A $20,000 Bet.

Increased interest in aeroplane experiments has been aroused by a bet of $20,000 a side between Vincenzo Florio, donator of the Florio Cup, and his countryman, M. Vonwiller, who finished second to Lieutenant Lahm in the Gordon Bennett balloon contest. The one to win the prize will be the aeronaut who first succeeds in flying around the oval-shaped Palermo racing track, 1,640 yards in length. The bet is open until the end of December, 1908; if both accomplish the feat the one who makes the best time will be the victor. It is the intention of the two bettors to employ Italian engineers only for the construction of their machines. M. Archdeacon, donator of the $50,000 prize, has suggested that instead of taking the stakes themselves the two Italians should hand them over for the development of aeronautics, by organizing a 15-mile race for heavier-than-air machines, with a cash prize of $20,000. He would have the race run on a closed aerial circuit, formed by two captive balloons, one kilometer apart.

AFTERMATH OF QUAKER CITY ENDURANCE.

PHILADELPHIA, Jan. 13.—Since the endurance run of the Quaker City Motor Club, the honors in which were finally awarded to the White, the wearing of chips on shoulders by agency and branch managers here is quite the usual thing. Challenges are flying; the contest committee has "explained"; resignations from the Quaker City Motor Club have been sent in; even ordinary observers have invaded the columns of the local dailies to explain just why they marked the penalties on the cars to which they were assigned. All of which goes to show that in promoting any competitive affair it is the height of prudence to see that in naming the important committees an effort should be made to eliminate the trade end.

In an organization like the Quaker City Motor Club, however, where nearly all the leading lights and workers are tradesmen, such a task is decidedly difficult. A similar state of affairs probably obtains in similar organizations throughout the country. Hence the imperative need of the national body taking some part in the management of future affairs.

While the technical committee in the Quakers' run were honest and above-board, and undoubtedly handled a ticklish job with judicial calmness and fairness, the closeness of the contest gave some of the contestants a chance to insinuate that friendship for certain of the contenders had swayed their judgment. The White protests against allowing the Peerless and Studebaker to finish clean in the original contest, which were written in the heat of battle, were strongly worded, and stirred things up more. The Peerless reply kept the pot boiling. Then the Studebakers challenged after being beaten out in the final, and the Whites replied that they didn't care to accept private challenges from rivals whom they had defeated publicly. Later the Pullmanites asked the Studebakers to have it out over the course, the former claiming minor troubles in the main event put them out of it. The latter have not as yet accepted the challenge.

Some comment having been indulged in as to the inability of air-cooled cars to cover such a hard course on schedule time, President Percy Neal, of the Quaker City Automobile Company, will send a Franklin over the 172 miles of the course to-day, to-morrow, and Wednesday, and between times will keep the engine running all night in the garage.

Meanwhile many of the contestants have found crumbs of comfort in the performances of their cars, and are telling the public about them in the automobile columns. Quite a number of sales have resulted directly from these performances, and there is a general demand for other similar contests here. But it is admitted on all sides that some changes must be made in the methods of naming the committees.

The final report of the club's technical committee, based upon an examination of the cars after the run-off tie, showed a one-point penalization for the White; nine points for the Peerless, and 27 points for the Studebaker.

Lozier Explains About Its One-Point Penalty.

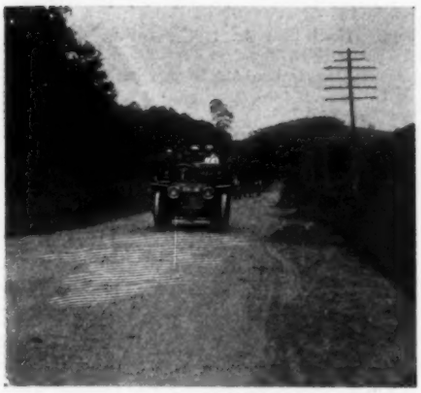
Editor THE AUTOMOBILE:

In your issue of January 9, under the table of general results showing the penalties in the Quaker City endurance run, the Lozier car is scheduled with a penalty of two points. Will you be kind enough to publish this correction, as the penalty against the Lozier in the entire run was only one point, this being caused by a momentary stalling of the engine. The rules stated that "a car shall be penalized one point for every one-minute stop," and as the motor was only stopped about ten seconds, the committee placed a penalty of only one point. With this exception the Lozier car went through the run with a perfect mechanical score, making every control, going and coming, on time.

Furthermore, the schedule contains a reference mark: "Not examined by technical committee." This also is an error, as the car passed the technical committee's examination and was declared mechanically perfect.

LOZIER MOTOR COMPANY,
New York City. C. A. Emise, Manager Publicity Department.

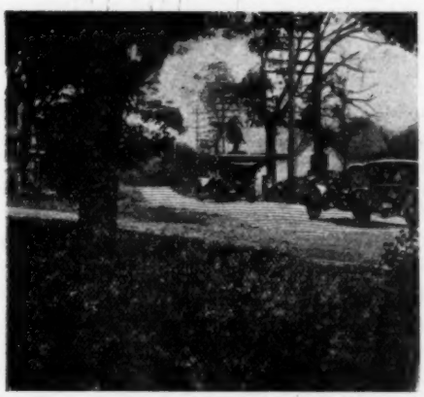
PROGRESS IN PLANS FOR BRIARCLIFF TROPHY



SKIRTING MT. KISCO—EXCELLENT GOING.

LONG, STRAIGHT STRETCH NEAR BEDFORD.

OILING THE ROADS NEAR BRIARCLIFF



MILLWOOD, WHERE A TRAP EXISTED.

INTERVIEWED in New York City at noon on Tuesday, T. F. Moore, secretary of the committee conducting the Briarcliff Trophy race, of which Robert Lee Morrell is the chairman, supplied the following particulars on the stock chassis contest scheduled over a course in Westchester County for April 24:

"At the present moment we have twelve paid-up entries from these firms," producing a list on which was written Hol-Tan, Isotta, Lozier (2), Renault, Fiat, Stearns (3), Panhard, Allen-Kingston, Simplex. "These are in addition to the Rainier entry made by Mrs. Cuneo, for which we have received this check (the check was produced), and twelve other firms that have assured us they will make engagements. We expect to receive these entries before Wednesday night, the closing date, and they will give us Isotta, Matheson, Fiat, Garford, C. G. V., Dragon, Chadwick, Pope-Hartford, Studebaker (2), Pennsylvania and Belden.

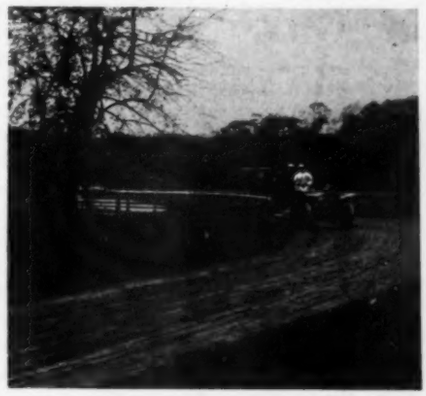
"A special meeting will have to decide on the acceptance of Mrs. Cuneo's entry and the extension of date for receiving engagements. It is very probable that the former will be refused and the latter agreed upon, a few days' grace being accorded to allow others to put in cars.

"The rules of the race," explained Mr. Moore, "call for a $1,000 entrance fee per car, half of which must be paid when entry is made. When all legitimate expenses have been met each entrant will have returned to him either $500 or such proportion as remains to be distributed. When full return has been made to the entrants the balance will be distributed in the townships on the course for road improvements. We have placed our entrance fee at $1,000 on the insistence of Mr. Morrell, to be assured of success; in other words, we have underwritten it to that amount. We are not speculating on grand stand receipts to meet expenses.

"How will the course be protected? I cannot say yet. Probably the grand stand will be on a three-mile stretch over which we have a complete right of way for each side of the road. We shall have 300 local men with power of arrest and will take into the county 900 guards, who will have to rely on moral suasion for their force, but these will be full grown men over 21 years of age, and not mere boys, as was the case on Long Island.

"Yes, there are railroad crossings on the course; there are four of them. It will be impossible to stop the train service, but as the donator of the cup and the chairman of the line are very closely connected, we shall have every facility for flagging the trains if a car is approaching. It is for this work that our three hundred guards will be principally employed."

CROSSING IN LIMITS OF BRIARCLIFF.



NEAR FOOT OF CROTON LAKE.

TURN TO A MILE OF BAD ROADS.

NEAR MOUNT KISCO, ANOTHER CROSSING.

ALL TECHNICAL CONDITIONS OUT FOR THE GRAND PRIX

PARIS, Jan. 10.—Taking as a basis the international regulations adopted by all European automobile clubs at Ostend, by which a four-cylinder engine should not exceed 155 millimeters bore, Secretary A. Sautin, of the Racing Board, has now announced conditions for all classes of machines taking part in the Grand Prix, to be held early in July. Makers wishing to enter any other than four-cylinder machines are now informed exactly what conditions must be met, whether their engine be a one-lunger or an eight-cylinder. It is not likely, however, that uniformity will be broken, except possibly by one six-cylinder car, makers being of the opinion that the four-cylinder type is most suitable for racing, most of them, indeed, having their plans already well advanced for engines of this class. The official notice reads as follows:

"All cars taking part in the Grand Prix of the A. C. F. must have a four-cylinder engine of 155 millimeters bore (6.102 inches) or its equivalent in useful surface, namely, 75476.8 square millimeters. This would give:

For a single-cylinder engine	310 mm. bore
For a two-cylinder engine	219 mm. bore
For a three-cylinder engine	179 mm. bore
For a four-cylinder engine	155 mm. bore
For a six-cylinder engine	127 mm. bore
For an eight-cylinder engine	110 mm. bore

"Decimals have been excluded in arriving at these figures, and no tolerance will be allowed. Each car in full running order, but without water, gasoline, tools, spare parts, or spart tires, must weigh a minimum of 1,100 kilogrammes (2,450 pounds). Oil in the crank and gearcases will be included in this weight."

As entries at ordinary fees will close on February 15, constructors are of opinion that the choice of a circuit should be made as early as possible. Though Dieppe is a formidable candidate, it is not at all certain that last year's course will be accepted, the township being willing to offer its subsidy only on condition that there be two days' racing, and the club not being disposed to repeat the experiment of 1906. Government permission to hold the race has not yet been obtained, and, although there is little or no danger of a rebuff, Premier Clemenceau being favorably disposed towards automobile racing, most constructors refrain from sending in their engagements until all formalities have been accomplished.

The only activity of the week among racing drivers has been the formal engagement of Rigal, as driver of one of the Bayard-Clément cars. Negotiations have been opened with Gabriel, for several years a constant member of the Dietrich team, to enter the Bayard service. Le Blon is spoken of as the possible third member.

COMPLETE ROUTE PLANNED FOR NEW YORK-PARIS RUN

THE exact route to be followed by the contestants in the 20,000-mile tour from New York to Paris has been announced by the Paris *Matin* and the New York *Times*, sponsors of the event. The journey, nine-tenths of which is on land under the power of the cars alone, and one-tenth by steamer, has been divided into three stages, as follows: (1) Across the United States to the Pacific coast; (2) through Alaska; (3) across Siberia and through Europe to Paris. Considerable changes on the route as at first announced have had to be made owing to the difficulty of traversing Alaska. The competitors will be taken by steamer from San Francisco to Seattle, where trans-shipment will be made to Valdez, no steamboat service being available direct from San Francisco to Alaska. Outside help is necessary at this stage of the journey in order to assure arrival in Alaska before the ice has broken up and the country become a huge morass.

Starting from Times Square about the middle of February, the route will be to Chicago. From this point westward exact route cannot be given, the organizers contenting themselves with naming the towns on the line of march, leaving it to the contestants to reach them as they may think best. The journey over the Rockies and the Wyoming plateau is not expected to be as difficult in winter as it is in summer, owing to the ground being frozen hard and most of the streams frozen. If there should be heavy snow it would not be more difficult to overcome than summer mud; in fact, to San Francisco there should be comparatively little difficulty.

Arriving at Valdez, Alaska, by steamer, the tourists will penetrate into the interior until they strike the Yukon, which they will follow down to a point from which Nome can be reached. The passage across the Behring Strait will be arranged from Nome City. The landing point in Siberia will be East Cape, where an 11,350-mile run will be made.

Henry Fournier, the ex-racing driver, now Paris agent for Itala cars, announces that he is preparing an Itala for the contest, and asks permission to start it a little later than the others. It is not known who will drive the winner of the Pekin-Paris tour, for Prince Borghese has emphatically declared that he will not take part in the longer run. Two De Dions and one Motobloc are completed and will be certain starters. About a dozen others, among them three or four American cars, are declared to be starters, but there are not very strong evidences of their active preparation for such a severe ordeal.

TARGA FLORIO TO OPEN EUROPEAN RACING

PARIS, Jan. 10.—Nine entries of three cars each from Fiat, Itala and Isotta-Fraschini have been received for the Targa Floria, the opening speed test of the European season. The race is to be held on a 250-mile circuit in Sicily, and is open to cars having a bore between 120 and 130 millimeters for four-cylinder engines, the conditions being practically the same as last year's race. The Chevalier Florio, who is almost entirely responsible for the financing of the event, refused to accept the conditions of the international conference, this race being the only one of importance in Europe on other than the Grand Prix rules.

In addition to the Targa Florio and the King of Italy's gold medal, the winner of the race will receive $3,000 in cash, the second $1,600, third $800, fourth $400, and fifth $200. Entrance fee is fixed at $200 per car, the limit per firm being four cars. French firms are attracted to the race by the offer of free transportation of their racing cars and drivers from Marseilles to Palermo. Among the drivers engaged are Lancia, Nazarro, Wagner and Minoia.

In addition to the race for the powerful cars, a voiturette speed test will be held on the same course two days before the Targa Florio, the main prize being a handsome silver trophy now held by Sizaire & Naudin. The course is an exceedingly difficult mountainous one.

THE GYROSCOPIC ACTION OF A FLYWHEEL

By ROGER B. WHITMAN.

IT is quite usual to hear some easy reference to "gyroscopic action" during the course of an explanation of the capsize of an automobile, and it is not an uncommon superstition that the revolving flywheel is the seat of a mysterious force that will roll a car over on a turn. After a study of the subject there can be no doubting that there is reason for these beliefs, but an explanation is necessary that the general understanding of the manner in which a car can be affected by the spinning flywheel may conform to the facts. The device known as the "gyroscope" shows the effects of some of the most interesting of natural forces, and while the causes of its evolutions are by no means understood and explained, a study of its movements will illuminate certain phases of the action of an automobile engine.

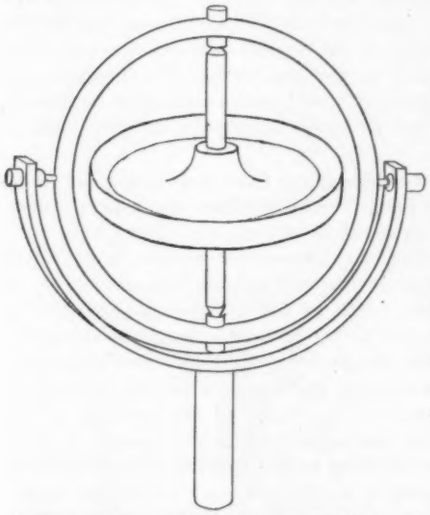


FIG. 1.—Common form of gyroscope with axis of rotation at right angles to that of spinning disk.

A gyroscope may be defined as a device intended to illustrate certain properties of spinning bodies, and the toy sold under that name consists of a ring that carries pivots at diametrically opposed points, in which revolves the axle of a heavy wheel or disk. When the disk is spinning, the toy shows a top-like tendency to stand up, or to swing around in a horizontal or inclined plane in apparent defiance of the laws of gravitation. If the ring is held in the fingers with the disk spinning, nothing unusual will be noticed until the hand is moved, when the apparatus will wriggle and twist as if attempting to escape, and will show every evidence of an opposition to the motion.

These are phenomena that are to be explained, but the construction of the gyroscope does not permit of the extended study that is possible when the ring is pivoted to a frame, the axis of rotation given to it being at right angles to that of the spinning disk (See Fig. 1). This frame is not difficult to construct, and the only precaution to take is to have the ring in balance on its pivots. When the disk is set in rapid rotation, and the frame held firmly in the hand, the axis of the disk may be pointing in any direction, but if the holder swings his arm so that the gyroscope is moved in a curved path in a horizontal plane, the ring will move on its pivots so that the axis of the disk becomes vertical. If the arm is swung at the side so that the curved path of the gyroscope is in a vertical plane, the ring will swing to permit the axis of the disk to lie horizontally.

Further experiment and observation will show that when the gyroscope is moved in a curved path, the axis of the spinning disk will tend to assume a position at right angles to the plane in which the curved path lies. Any rotation in a horizontal plane is rotation about a vertical axis, and rotation in a vertical plane is about a horizontal axis. The rule deduced from the action of the gyroscope may therefore be expressed in other terms, viz., the axis of the spinning disk tends to set itself parallel to the axis of the greater circle in which it is moved.

This property of the gyroscope, as brought out in these experiments, is accompanied by a phenomenon that is even more striking and difficult of explanation, which is the tendency of the ring to invert itself on its pivots. If, when the disk, as seen from above, is revolving anti-clockwise, the gyroscope is moved from left to right, or clockwise, the ring will invert itself in its pivots, so that the side of the disk that then comes uppermost is revolving clockwise. The movement of the gyroscope in the opposite direction will be accompanied by the instant upsetting of the ring, so that the direction of the disk as seen from above again becomes anti-clockwise, to correspond with the movement of the hand. From further trials a second rule governing the action of the gyroscope will be deduced, that the direction of rotation of the disk tends to be the same as that of the greater circle in which the gyroscope is being moved (See Fig. 2). If the frame is removed and the same experiments performed with the ring held in the fingers, the tendency to follow these laws of the gyroscope will be evidenced by the apparent endeavors of the ring to escape from the grasp, and the wriggle and twist that will now be understood as indicative of the struggle of the disk against the restraining fingers to set its axis parallel to the axis of the greater circle, and to have uppermost the face that revolves in the same direction.

The struggle of a restrained gyroscope to follow its laws will have a tendency to keep the restraining structure from the change in position that would alter the direction of its axis of rotation. This is taken advantage of in the apparatus for checking the rolling of a ship in a seaway, the heavy disk spinning at high speed being placed with its axis vertical. The gyroscope by its weight and speed tends to remain with its axis vertical, and opposes any force that tends to alter this position. The ship is thus the object of opposing forces, of which one, the gyroscope, tends to hold it upright, while the other, the pressure of the waves, tends to roll it over. The gyroscope being the stronger of the two, the rolling motion that would alter the position of its axis is suppressed. As the axis of the gyroscope is vertical, and as the turning of the ship in response to its helm is rotation in a horizontal plane and about a vertical axis, there is no opposition to a change in the course.

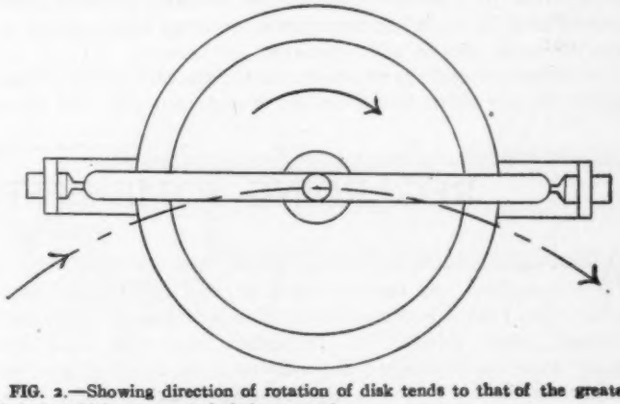


FIG. 2.—Showing direction of rotation of disk tends to that of the greater circle in which gyroscope is being moved.

Gyroscopic action is not confined to laboratory apparatus, for it is exhibited by every spinning body, and its effects are shown in boys' tops as well as in the march of the planets about the sun. The flywheel of an automobile engine, being a spinning body, may therefore be expected to exhibit gyro-

scopic tendencies, and that it does so is amply proved by the condition of the flywheel bearing after a few thousand miles' running. It is well understood that this bearing is the first to give out, and it is the usual practice to make it longer than the others in order to render the wear uniform. While there are many causes for the rapid wear of this bearing, a study of the conditions will indicate that gyroscopic action plays a much greater part than is usually supposed. If the comparatively slow rotation of its three-ounce disk can make it practically impossible to move the toy gyroscope with a steady motion, and to prevent jerking, it is only to be expected that a heavy flywheel revolving at high speed will have its effects on the parts that are designed to hold it rigidly in position.

In the most usual construction, the axis of the flywheel is horizontal and longitudinal. A car making a turn moves in a horizontal plane about a vertical axis, which results in the immediate endeavor of the flywheel to place its axis in a vertical position. That it is unable to accomplish this is due to the construction, the flywheel bearing being the chief factor in its restraint. In going from a down to an up grade the car will move in a vertical plane about a horizontal axis, and the flywheel will then endeavor to assume a position in which its axis would be parallel to the axis of the greater circle, a tendency that would result in twisting the crankshaft into a transverse position. Every change in the direction of the car thus results in a strain on the flywheel bearing that is directly due to the endeavors of the flywheel to set the crankshaft on end or to twist it across the car.

The force with which a gyroscope acts increases with the weight of the spinning disk and with its speed, but the greatest effect accompanies the most abrupt effort to alter the position of its axis. Under normal conditions, the weight of the car is sufficient to hold the flywheel bearing to its work of restraining the gyroscopic inclinations of the flywheel, and there is no further effect than the wear. When a car takes a corner at high speed, however, the tendency of the flywheel to up-end the crankshaft will result in a tendency to up-end the car, and the cumulative effect may well be greater than the weight can hold in check. As speed is further increased there will be a critical point at which weight will be overcome, and the gyroscopic action as master of the situation will raise one end or the other of the frame to such an extent that either driving or steering wheels will lose traction. Whether it is the front or rear wheels that will be affected will depend on the direction of the curve and the direction of rotation of the flywheel, for the tendency of the latter will always be to bring uppermost the face that rotates in the direction of the greater circle.

Attempts to explain accidents to racing cars while rounding turns are often based on the assumption that the gyroscopic tendency of the flywheel will be to roll the car over, but that this is not the case may be deduced from the fact that a car rolling over sideways will be rotating in a vertical plane and about a horizontal axis, and that as the axis of rotation of the flywheel is horizontal, it will remain in its position rather than tend to change it. The real effect is a tendency for the car to lose its grip on the road, and this will be equally disastrous whether it occurs with the front or the rear wheels. Decreasing the weight on the front wheels will result in the loss of control of direction at a time when steering ability is most necessary, while if the power of the engine is applied against maximum traction at the rear wheels, and the traction is suddenly reduced, the engine will race and the speed of the driving wheels increase. The restoration of traction as the car strikes the tangent will give all of the essentials of a skid, and under such conditions the loss of a tire, which will most clearly be an effect, will be blamed as the cause.

Here, then, is where the danger from gyroscopic action of the flywheel is to be found. The obvious methods of averting it are to keep the speed of the car on curves below the critical point at which the gyroscopic action becomes so great that the weight of the car cannot restrain it, or to take turns in the road with as flat a curve as possible, in order that there may not be too abrupt a change in the direction of the axis of the flywheel. It would of course be possible to nullify the action by gearing in a second flywheel of equal size and weight, but revolving in the opposite direction. Such a construction would reduce the danger of skidding on turns, and in enabling racing drivers to make time on curves instead of losing it would make the additional weight a matter of little consequence, though the action of centrifugal force on the car as a whole also imposes a speed limit on curves that cannot be neglected.

To the reader whose unfamiliarity with gyroscopic action makes him skeptical of this force with which the spinning flywheel is credited, a few minutes of experimenting with a toy gyroscope will be enlightening. A more convincing test is to hold a wheel of any sort, but preferably a bicycle wheel, by the axle close to the hubs, and to try to invert it while it is spinning. As further evidence may be cited the recorded tests of a German torpedo boat one hundred and sixteen feet long and of fifty-six tons displacement, held level in a heavy seaway by an eleven hundred pound disk spinning sixteen hundred revolutions a minute.

While the gyroscope is one of the least-understood of mechanical devices, what is known of it presents undeniable evidence that tire blow-outs, defective steering gears, and other defects claimed to be the causes of automobile accidents, were not always such, but, together with the accidents, the effects of this property of a spinning flywheel.

REGARDING SOME DEFECTS OF TOOTHED GEARS

AT a recent meeting of the Royal Automobile Club, F. Humphris, the inventor of a gear of the pin and faceplate type, read a paper entitled "Tooth Gears and Gearing." Among other things, Mr. Humphris said that little had been done to determine the efficiency of toothed gearing, and that, in his opinion, the toothed gear was the most imperfect motion employed on the automobile. Considering the grinding and purring of two gears in engagement, could the designer say that it was the system which allowed the wheel to exist, or must he not admit what a clever man the metallurgist was to have provided a material that would stand this barbarous treatment? If the motion of the teeth of two gear wheels when engaging were entirely confined to a rolling character, their life would be practically indefinite. To improve upon the present system would necessitate making a gear the teeth of which did less sliding upon one another, with a surface contact of greater dimensions, greater strength, less weight, reduction in the number of engagements for the work done, and teeth which, in addition to all these qualifications, will not change in form through wear, thus destroying the curves necessary to their perfect engagement. This could only be done by making the true toothed curves in sympathy with the mating member on which they engaged. The tooth to which Mr. Humphris referred was circular in cross section with a hemispherical end, engaging in a plate having circular holes and driven at right angles from the propelling shaft. Tests showed a very small loss of power in transmission.

AN INTERESTING CHAPTER FROM THE PAST*

By POL RAVIGNEAUX.

DAIMLER is an investigator who has transmitted to posterity the most prolific collection of patents concerning the internal combustion motor and the automobile. From the first, these patents were all taken out by Daimler in his own name, but since 1890 there are found interspersed among them the patents of the Daimler Motoren Gessellschaft and those of

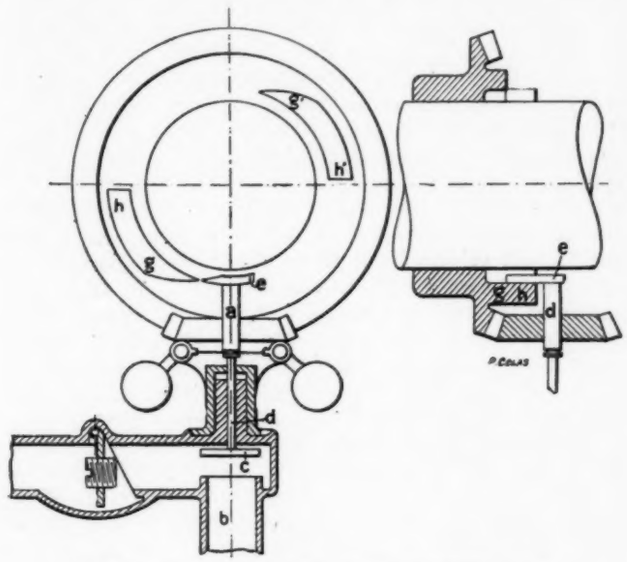


FIG. 1.—Governor of Daimler's first motor, patented in 1875.

Daimler et Vve. Levassor, as the patents taken out by Daimler and his French collaborator were termed after M. Levassor's death in 1895. After a time the house of Panhard & Levassor took ous some patents in its own name, which we mention later on, in view of the commercial relations which united Daimler with that firm. A short *résumé* of Daimler's career may be apropos here, though it is not the intention to go into detail, a full account of his life being found in *L'Histoire de l'Automobile,* by Pierre Souvestre. He was born in 1834 and died in 1900. It was not until 1863 that he realized his own powers of initiative, after having had a long conversation with Otto. The latter had been interested in commercial pursuits, but had given them up on learning of the work of Lenoir, devoting himself to the development of the gas engine.

Daimler was subsequently employed in a German arms factory and later in an English locomotive works, in the meantime doing what he could, but he matured his plans thoroughly before proceeding, as it was not until 1875 that he took out his first patent. A little later he established relations with M. Sarrazin, the representative in Paris of the house of Otto & Langen, which later turned over to M. Levassor of the firm of Panhard & Levassor the task of executing his plans for a motor. Mme. Sarrazin later became Mme. Levassor and in this way the house of Panhard & Levassor acquired a license to manufacture under the Daimler patents, as the sole French rights had been granted to Sarrazin shortly before his death, and they descended to his widow.

Daimler had exhibited in 1889 at Paris a gasoline motorboat—this being the principal use which he predicted for his motor—a quadricycle and a miniature tramway, which was shown in operation at the Exposition. He continued his labors at Canstat, Panhard & Levassor meanwhile working independently. Levassor, after eighteen months of discouraging set-backs during his daily trials, finally succeeded, about the beginning of 1891, in realizing a dream that he had long cherished, that of making without a stop the trip from Ivry to the Point au Jour and return, a distance of about twelve miles. That date marks the origin of the success of the old French house, the investigations of which are so closely related to the researches of Daimler that it is difficult to separate them in giving credit for the results.

It was not until 1893 that Daimler, aided by his engineer, Maybach, succeeded in running the first Mercedes automobile on the road. It may be said here in passing that in order to avoid confusion I have limited my researches regarding the achievements of our predecessors to those prior to and including the year 1895, for about that time so many ideas were being tried out that it would be a most difficult thing to establish their paternity.

The first incursion of Daimler into the internal combustion motor field did not appear to be inspired by a desire for simplicity, for in a patent taken out in 1875 he describes a complicated mechanism covering an idea which Lenoir had investigated and abandoned, that of relieving the piston and connecting rod of the shock of the explosion in an atmospheric motor. To accomplish this, Lenoir placed an extremely heavy piston in a vertical cylinder, so arranged that the explosion lifted the heavy piston, which in its descent was depended upon to perform the work. Daimler added to the ordinary piston in a horizontal cylinder a couple of loose pistons placed at an invariable distance apart and situated on either side of the ordinary piston. The energy of the explosion set these two in motion, and the vacuum set up by the cooling drew after it the motor piston. As was the case with Lenoir, Daimler was on the wrong track, but the latter followed it out until it materialized in the shape of an impractical, delicate and costly machine.

Under this first Daimler patent the piston was cooled by a circulation of water through the connecting rod as is the case to-day in many large stationary motors. The speed of the motor was regulated by a governor on the admission, a valve being placed on the inlet and controlled by the part *d,* shown in the illustration, Fig. 1, which the governor caused to rise or drop, in such a manner that at a certain speed it moved a plate which completely closed the opening. The carbureter was warmed by the water circulation. Referring to the illustration, Fig. 1, the valve *c* could close the inlet pipe when lowered by *gh,* this taking place when the balls of the governor were spread by centrifugal force, otherwise the hook *e* missed *gh.*

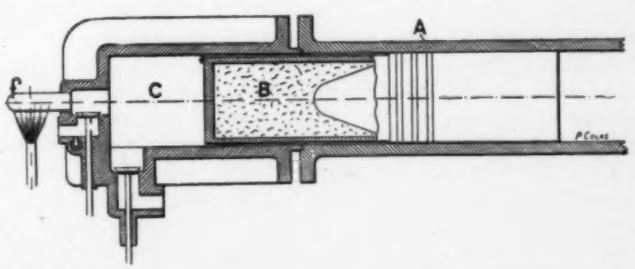


FIG. 2.—Section of early Daimler, showing tube ignition, patented in 1884.

The last-named part was duplicated because the motor described under this patent of Daimler's was of the two-cycle type.

In 1882 Daimler took out a patent on an inverted cone clutch, and in 1884 he attacked the problem of ignition, believing in the permanent success of burners and platinum tubes, which supplanted the slide valve and pocketed flame, and which battled a long while with the electric ignition introduced by Lenoir, using

*Translated from "La Vie Automobile" by Charles B. Hayward.

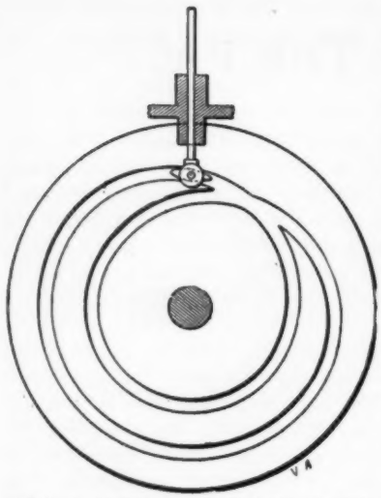


FIG. 3.—The predecessor of the exhaust valve cam and customary turning gears.

batteries, and with that of Forrest, employing a magneto. Daimler's design is reproduced herewith. See Fig. 2. There will be noted in this the ingenious fashion in which Daimler disposed the motor in order to cool the piston. The cylinder head was cooled by a flange, but this did not reach down as far as that part of the cylinder against which the piston rings bore; these were placed much further down on an extremely long piston. This permitted of replacing the cylinder without the necessity of obtaining a new cylinder head—a piece on which a great deal of work was expended. Ignition by tube, however, was only provided as a means of starting, as Daimler depended on automatic ignition once the motor was under way. Spreading the piston rings some distance apart in order to permit of lubricating them properly was a logical sequence, and constituted an invention on which a number of patents were taken out. In the illustration, Fig. 2, the piston is shown filled at its upper end with *calorifuge*, and the diameter of the piston was reduced at this point, in order to prevent the burning of the oil, as the motor was designed to run on automatic ignition, except when starting, for which the incandescent tube was utilized. The cylinder is represented by *A*, the *calorifuge*, which consisted of slag or cinders, by *B*, and the cylinder head by *C*, while *f* is the hot tube for starting. This patent was granted in January, 1884, while that shown in Fig. 1 was issued in March, 1875. There is also one taken out in 1884 for a fan in the flywheel and an air-jacket as shown in Fig. 4.

The surface of the cylinder head is reduced to a minimum in order to diminish the waste of heat through the walls, something which worried Daimler not a little, while both the valves are placed above the piston. The exhaust is operated by a curved piece, *M*, Fig. 4, terminating in a hook at its lower end. This hook engaged with a similar one on the upper end of the vertical rod *K*, which at its other end carried a roller held in a groove, forming two concentric circles, Fig. 3, thus avoiding the use of a timing gear and secondary shaft. Regulation was affected entirely by the exhaust, a piece carried on the small exterior flywheel acting as a governor and causing the piece *o* to turn so that it missed the valve rod and the valve remained closed. Starting was aided by a compression release.

It was in 1885 that Daimler inaugurated one of the two principal characteristics of his motors; the first related to the functioning of the cycle and the second to the constructional disposition of the cylinders in the shape of a V. His chief idea was that of obtaining the maximum efficiency, as is illustrated by the following quotation from the patent just referred to.

"The new motor which I am about to describe has for its principal advantage the ability to operate at an almost unlimited speed (even up to 1,000 r.p.m.); it weighs very little and takes but little space; its power proportionate to its volume is greatly superior to what can be obtained under any of the present systems, and the importance of this invention for propelling aeronautical machines, torpedo boats, etc., is conceded."

But Daimler looked far ahead and saw clearly. Working according to well-formulated ideas, he had reduced the cylinder wall surface to a minimum, raised the compression and employed automatic ignition, but this did not suffice. In order to simplify things he went back to the lateral arrangement of the valves, but he achieved in other ways more than he lost by this. Before describing the cycle it may be well to study the accompanying sectional view of the single-cylinder motor of the enclosed flywheel type. Are not the splash lubrication, the flywheel assemblage by taper and screw and the disposition of the valves, prototypes of present-day practice? Daimler wished to introduce into the cylinder a supplementary charge of carbureted mixture, or of air, by means of a pump constituted by the crankcase of the motor itself, and, as is the case in a great many two-cycle motors to-day, this was accomplished by placing a valve centrally in the head of the piston. This was at once an automatic and a timed valve.

At the beginning of the exhaust when the piston had arrived at the end of its downward stroke a circular piece, *F*, raising the inlet valve a short time after the exhaust valve opened, the gases which had been drawn through the automatic inlet valve, *T*, placed at the side of the crankcase had by then been strongly compressed in the latter, and, entering the cylinder violently blew out the burnt gases. Until the piston had traveled a certain distance on the upward stroke, this valve remained open and the exhaust continued, so that when the exhaust valve closed it will be seen that the amount of burnt gases remaining in the cylinder must have been very small, and the two did not mix as the cold gas introduced through the piston assumed a stratified form in the lower part of the cylinder. In redescending, the piston compressed the gases beneath it to a certain point, and then the piston valve reopened and remained open up to the beginning of the compression stroke.

Unfortunately, we do not possess comparative figures showing the power of these two motors, from which a conclusion regarding the utility of this complication could be drawn. Daimler's chief object was to produce a motor of the maximum power which should be the quintessence of lightness, and we should not overlook the fact that it is due to that lightness of the explosion motor that the automobile is possible. To-day, if it were possible to obtain greater power from a motor by adding Daimler's valve, it would not be done by reason of its complication and fear of breakage, and because the extra power thus obtainable is not a great necessity. We are well enough served without it, but in 1885 *it was necessary to make arrows out of any wood;* the power output of those days was not that of the present. It is not astonishing, in view of this, that Daimler should have sacrificed simplicity to attain this end. This brings Daimler down to the time when he became an autoist.

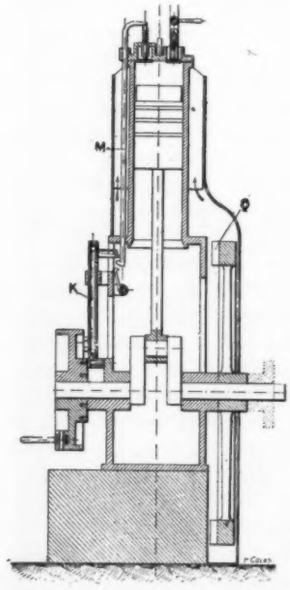


FIG. 4.—Daimler motor with air-jacket cooling and valves in the head.

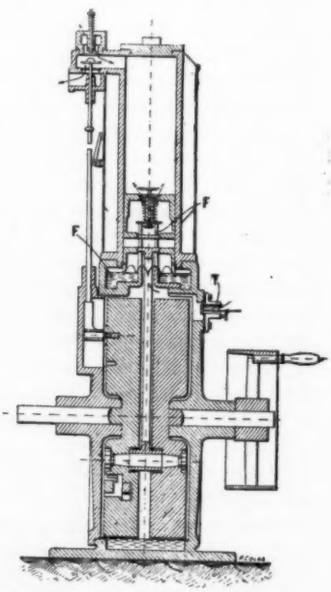


FIG. 5.—Inclosed flywheel type with valve in piston, patented in 1885.

A STORY OF THE CRY OF "GET A HORSE"

By A. V. A. McHARG, Edgewater, N. J.

TO the funny side of automobiling I want to add my own little story of pioneer effort in the whiz-wagon industry. It was just after Alexander Winton had made his trip from Buffalo to New York in a gasoline wagon of his own design that my ambition to produce a self-moving vehicle became uncontrollable. Reasoning that if one horse pulled a wagon satisfactorily a one-horsepower motor should be able to do as much, I soon came across in our local papers an "ad" of a small farm motor of just the desired power—and many other wonderful qualities to boot. I lost no time in arguing my young wife into the belief that an expenditure of sixty dollars toward a motor wagon would be fully repaid by our increased social prominence—and the motor was duly purchased.

I had never seen a gasoline motor, nor had any member of the family, and so it was with fear and trembling that the last connections were made and about a pint of "that stuff they clean gloves with" was emptied into the tank. The electric switch was turned on, and, cautiously, the flywheel was turned according to directions, with no results. The family courage began to rise and they gathered more confidently around the little marvel. Suddenly there was a spit and a flash, then a roll of musketry as the little marvel became a little devil, and straightway there was a sincere effort on the part of the family to leave me alone in my researches.

How I Conceived the Idea of Building an Auto.

After several evenings spent in running the little motor—and also in finding out why it wouldn't run—I decided to get to work on designing and building the wagon that should contain this remarkable source of power that was guaranteed to run a farm, milk the chickens and churn the eggs. I lost a whole week and two fairly good bicycles trying to adapt their running gear to my needs, without success. So I sent for some wire wheel catalogs, and finally ordered four steel rims and a sufficient number of spokes. The hubs were made of brass, with flanges for the spokes and a hole for one-inch cold-rolled steel axles. Here I was confronted by a new problem: I had to build and house this vehicle in the kitchen of our dwelling, and the only means of egress was a three-foot-six window opening on the street level, consequently I was limited to 3 feet 5 inches for the width of my wagon.

A Machine That Was Fearfully and Wonderfully Made.

After much thought the wagon was built on the "buckboard principle:" two oak planks about five feet long, one inch thick and ten inches wide were bolted to two battens at the ends. The rear axle turned in brass bearings bolted to the planks, while the front axle swiveled on a king bolt and was controlled by a steering post and handle that projected up through the planks. The motor was firmly set amidships and bolted down to the plank frame. The crankshaft projected out on the left hand side. On this shaft was keyed a four-inch pulley, carrying a two-inch belt that drove an eight-inch pulley on a countershaft. On this countershaft was keyed a two-inch gear meshing with a ten-inch gear keyed to the rear axle. The driving belt was loose and only drove when an idler was forced into position by a lever at the "chauffeur's" right. There was no provision for reversing, it being forward only that we hoped to go. After the cooling tank and the gasoline tank were placed, a wagon box and seat were built around the machinery. True the family and a few intimate friends admitted confidentially to me that there was a confounded resemblance to a dog house about the thing, but I excused that on the ground that they could not keep pace with my marvelous originality.

Well! one starlight night in November the last bolt was tightened; the last bit of paint was dry, and, after a hurried evening meal, we filled the tanks with water and "glove cleaner" and took the sash out of the basement window.

We rolled this marvelous creation out by the curb, and the crowd soon began to collect and the comments to fly: "What are you going to keep in it?" "Whose dog have you got in there?" "Which way will it run if it goes?" etc. Spurning all remarks, I threw on my electric switch, opened my gasoline valve, and, thanks to a merciful providence, the motor started at once; whereupon I cast a compassionate glance at the startled crowd, for as yet a muffler was unknown to me and the noise seemed to indicate power, so I liked it.

First Trial Was an Event in Local History.

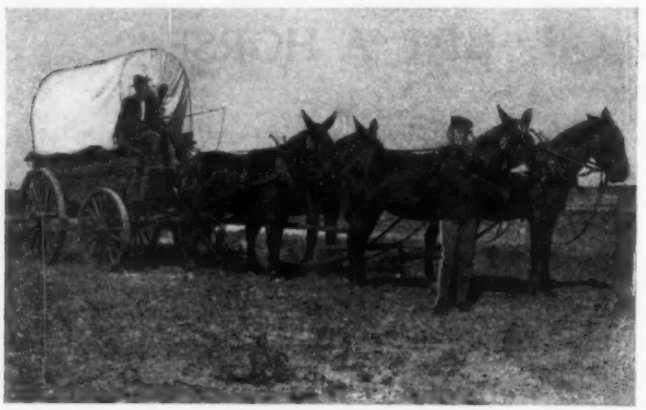
Inviting my wife to take the seat of honor at my left, I jumped to the operator's seat, and with a trembling hand pushed the starting lever into position; slowly, slowly, she started and slowly she continued to move, in fact, that was her maximum speed, and to the great joy of the crowd they were able to keep alongside of us at an easy gait and resume their study of the situation and compose remarks calculated to establish their reputations as humorists. We finally—I say finally—reached one of the principal streets, and by that time had accumulated quite a following, sufficient in fact to arouse the curiosity of a police officer who came toward us on the double quick to investigate the riot that was rapidly assuming such serious proportions. At first he was nonplussed, then, making one of those quick decisions for which the law is famous, he decided to grant us his protection, and informed us that as long as we stayed on his beat we could get a square deal. So he nonchalantly swung his club, walked alongside, and kept up a running fire of conversation, which was eventually interrupted by my running up a slight grade ending in car tracks.

Sad Ending of an Experimental Career Well Begun.

There we stuck, and, try as I would, I could not keep that belt from slipping. To add to the embarrassment of the situation a trolley car appeared, but in spite of the interest we created the motorman refused to tie up the line indefinitely. So with the help of the officer the devil wagon was backed off the tracks against its will and down the grade where we managed to turn around and get under way on our homeward journey. All went well, though slowly, until within a block of our house, there she stopped, and stopped for good. No amount of engineering skill, no amount of outside advice availed to produce further action; so upon that spot, covered with ignominy and oil, I was at last compelled to solicit assistance and push the blamed thing home, in through the kitchen window, put up the shutters and quit for the night, amidst cries—uttered for the first time on earth I believe—"Get a horse!" "Get a horse!"

So ended my first attempt to be an automobilist. I afterwards located the fault in my motor, but never succeeded in making the vehicle go faster than a walk or up an incline greater than two per cent. I finally sold my motor to a farmer, where it apparently felt more at home, for, so far as I know, it is running yet and giving complete satisfaction.

British Board of Trade reports for the month of November, 1907, show the number of cars imported into Great Britain was 409, and for the corresponding month in 1905 and 1906 was 352 and 359, respectively.



PRAIRIE SCHOONER FORMERLY USED BY LIEUT. GIMPERLING.

HOW THE AUTO AIDS UNCLE SAM.

Lieutenant Gimperling, 21st Infantry, U. S. A., evidently does not place overmuch stock in the saying that nothing can take the place of the army mule for getting there, for, having been detailed by General Thomas, commanding the department of Colorado, to make a progressive military map of southern Arizona, he has decided to do it in an automobile and has selected a Stoddard-Dayton in place of the time-honored covered army wagon. Instead of averaging twenty to twenty-five miles a day, the survey will proceed at that rate *per hour*. The party consists of the lieutenant in charge, H. M. Westcott, and Arthur Harris, the driver, and they left Denver recently en route for Fort Huachuca, Ariz., a preliminary thousand-mile trip which has to be undertaken in order to reach the scene of their labors. The route there lies via Pueblo and then along the old Santa Fé trail through New Mexico and Arizona, their objective point being located in the south central part of Arizona, to reach which it will be necessary to travel through country of a nature that has done much toward earning the army mule his reputation of being able to get there, for prior to the advent of the automobile the mule and the broncho were the only animals of transport sufficiently hardy to be able to withstand the rigors of such work as it entails.

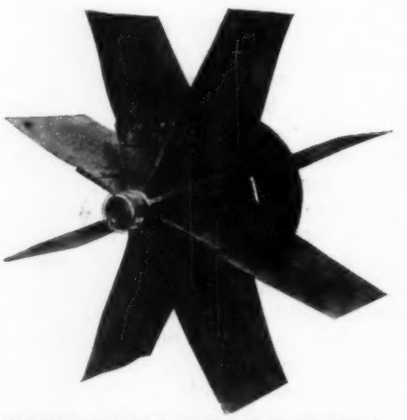
There a detail of troopers and a mess-wagon will be assigned them as the work, which consists of making a topographical map of southern Arizona, will require several months for its completion. The Stoddard-Dayton car employed is not the property of the army, but is owned by Mr. Westcott. It will be used for the entire trip, and as it is the first time that an automobile has ever been employed for the purpose, the outcome will be watched with interest, particularly by General Thomas. who granted its use.

LIEUT. GIMPERLING IN STODDARD DAYTON ON THE WAY.

A COPPER TUBE CENTRIFUGAL RADIATOR.

A distinct departure from the types of honeycomb and tubular radiators, which form the two main classes of appliances for cooling the water of an automobile engine, has been produced by the firm of Goudard & Mennesson and was offered for public inspection for the first time at the recent Paris exhibition. The G. & M. consists of a mass of copper tubes forming a circle three or four inches in depth and about four inches from front to rear, united at opposite points by a couple of collectors forming inlet and outlet. An idea of the general arrangement can be obtained from the illustration, reproduced from *L'Automobile*. To allow of the free passage of air the tubes are separated from one another by the two ribbed frames shown at left and right of the cut. The circle of tubes is held in position by a couple of pressed steel plates forming a housing, the forward plate having a central opening, the circumference of the inner ring. Within the circle a powerful centrifugal ventilator is mounted, the steel plate at the rear and radiating arms in front affording a bearing for this.

COPPER TUBE CIRCULAR RADIATOR.



VENTILATOR TO BE CENTERED IN TUBES.

The warm water arriving from the motor by the upper collector is distributed through the tubes to the lower collector, from which it passes, cooled, to the engine again. At the same time the centrifugal fan is drawing in cold air by the central opening and throwing it upon the rings of tubes. It is claimed that efficiency is so much greater by this system that instead of running the fan at two or three thousand revolutions a minute, as is often done, it can be run at 1,200 revolutions and supply all the draught required. By this system the radiator is completely independent of the hood of the motor and has the advantage of not drawing in dust on the engine, as is done when the fan is placed immediately behind the radiator. A claim of robustness is put forth on the grounds that the rings of tubes are merely clasped between the two steel plates, and that the group has a certain suppleness which prevents it suffering from road shocks. The radiator has been used on stationary engines, the fan being driven by belt off the engine flywheel.

"To instantly locate a knock beyond the shadow of a doubt, borrow a stethoscope and use it on the motor as a doctor would on a patient," says a young auto engineer who is also an M.D. Of course, every autoist cannot borrow such an instrument, and the majority would not know how to use it if they could, but the facility and certainty with which it distinguished a knock as being in the wrist pin of a certain cylinder, all other tests failing, was certainly amazing.

LETTERS INTERESTING AND INSTRUCTIVE

LAYING UP A CAR FOR THE WINTER.

Editor THE AUTOMOBILE:

[1,093.]—I would thank you very much for some information on the following. In laying up my two cars for the winter in my suburban home on Long Island, both of which are of the same make and both two opposed cylinder engines, I ask: If I open the pet cocks in the radiators, will it completely exhaust the water from the radiators and the cylinders, or whether enough might remain to cause freezing and damage. Again in jacking up the car, taking the weight from the tires, is it better to allow them to be fully inflated or to deflate the tires, or only partially so? Also, will gasoline left in the tank freeze in low temperature? Also, would you suggest in allowing the lubricating oil to be left in the oiler or withdraw same? Should the spark plugs be removed from the cylinders and a small quantity of kerosene put in to prevent rust? In short, any information that you can give me as to minor details of laying up a car for the winter will be fully appreciated, and I think beneficial to the owners who care for their own cars.

Trusting you to answer this in your most instructive column of "Letters Interesting," I remain, T. C. SNEDEKER.

New York City.

Putting a car out of commission for the winter may consist of anything from running it into the barn and closing the door, to a most elaborate process, but it is not advisable to adopt the first extreme and not necessary to go to the latter. Whether the radiator petcock will drain the entire system of water or not, depends on its location. If it happens to be the lowest point in the circulating system it will, but it is advisable to open other connections, as at the pump, or other convenient point as low as possible in order to be certain of getting all the water out. We should think that it would be preferable to have the tires partially inflated, but tire experts may disagree on this point, however. Before leaving them this way, they should be removed from the rims, and if the latter show any signs of rust, this should be removed and the rims given one or two coats of shellac, the tires being replaced after this has dried. The gasoline is not at all apt to freeze at any temperature usual in this latitude, but as it constitutes an element of danger in that it is considered to greatly increase the fire hazard to any building in which it is present, it is preferable to empty the tank. This also applies to the lubricating oil, but for a different reason, namely, that the oil may thicken or gum in the tubes and be more difficult to remove in the spring. Empty the entire lubricating system and flush it out with gasoline. It is also advisable to inject a little kerosene in the cylinders, but the plugs should be replaced. Any bright steel parts that are apt to rust should be coated with grease or thick oil.

DERANGING THE VALVE-TIMING OF THE MOTOR.

Editor THE AUTOMOBILE:

[1,094.]—In letter No. 1,062, published in the January 2 issue of "The Automobile," a subscriber asks you the following: "If, in timing an engine, the two to one gear is slipped one cog either forward or backward, can the correct timing be made again with the commutator, pushing it either forward or backward?" You answer that it can, saying that moving the commutator will naturally compensate for shifting the gears. That is true as far as the ignition is concerned, but it is not also true that any change in these gears changes the timing of the valves themselves, and this cannot be corrected by moving the commutator. Would not your answer to this question be liable to cause him some trouble?

Brattleboro, Vt. CHARLES A. SMITH.

It would, unless, as we presumed to be the case at the time, it was only intended that the pinions should be revolved forward or backward, and not their camshafts, though as a matter of fact we must confess that this was something which was overlooked in answering the letter in question. If the timing gears were moved backward or forward, while attached to their respective camshafts, this would naturally move the inlet and exhaust cams one way or the other and a derangement of the valve-timing would necessarily follow.

NOT THE BATTERIES THAT ARE FAULTY.

Editor THE AUTOMOBILE:

[1,095.]—Please answer the following in "Letters Interesting and Instructive." I use a Splitdorf coil, and for some reason the dry batteries do not seem to last but a short time. I have used "Ever Ready," Columbia, and two or three other good makes. By the time they have run 300 or 400 miles they will not register more than 1 or 2 amperes. I have a single-cylinder Oldsmobile runabout. Is it the coil? Is it because the batteries are grounded too long? I have followed the instructions of the manufacturer in the length of revolution of engine in grounding batteries, 1-3 of one revolution of engine, which is a four-cycle. SCHUYLER G. FOSTER.

Allegan, Mich.

It is quite evident that the cells you have been using have not been at fault, but that the trouble is to be found either in the timer or coil, or possibly both. We presume you wish to be understood by "grounded for 1-3 of a revolution" that this is the duration of the contact employed to produce the spark, in which case it is nothing strange that you have had experience of this nature with dry cells. While makers differ on this point, 50 to 60 degrees on the crank circle is ample to allow for advancing and retarding the time of sparking, slightly more being allowed for advancing than retarding. This would be only 1-6 of a revolution, but as a matter of fact, we do not believe that as much as this is allowed on the majority of present-day cars, so that you are wasting a very large percentage of the current delivered by the batteries. The Oldsmobile runabout was not distinguished by a very advanced form of timer, and doubtless a new and up-to-date device, which could be fastened to the rear end of the camshaft most conveniently, together with the proper adjustment of the coil, would remedy the difficulty.

WHAT PREVENTS A WORM GEAR STRIPPING?

Editor THE AUTOMOBILE:

[1,096.]—Could you answer a few questions through your valuable medium "Letters Interesting and Instructive?" Some cars, foreign, I believe, employ a worm drive. My question is: Why do not these gears strip when the driven member of the transmission becomes the driver, as is the case when the power is shut off? I have before me an "ad" cut from some journal, giving an illustration of a Christie touring car. Could you, or have you, described this car (either tourist or racer) in detail? Mr. Christie has made such a radical diversion from standard lines that, while we are all familiar with its appearance, I find few people who know much about its mechanical features. All they know is that it is front drive, but when they try to enumerate, I find they do not know much more than myself. Perhaps your answer will be long, but I know you will go a long distance out of your way to oblige a writer—much more than several editors which I have in mind.

Brooklyn, N. Y. ROYAL H. WALTERS.

A number of heavy 'buses, which we believe are still in daily use in London and vicinity, are equipped with a worm drive. The same is true of the Mitchell commercial cars made in this country, and it has been reported from time to time that others were considering its adoption. The reason that these worms do not strip when driven by the car instead of driving it, is due to the fact that the pitch of the thread has been calculated to avoid this, in which respect they differ from the ordinary worm gear.

The Christie racing car which was run in the Grand Prix in France and in numerous races in this country since then, was described in detail in the issue of THE AUTOMOBILE of April 11, 1907. The transversely placed engine drives the front wheels directly through the medium of a conical friction clutch at each end of the crankshaft, so that when the car is running on the direct drive the wheels are practically on extensions of the crankshaft, universal joints being interposed to allow for relative movement, and they make one turn for every revolution of the motor. To provide a low speed forward, a small pinion attached to the center of the

crankshaft meshes with a large spur pinion on a countershaft running parallel with the former and inside the crankcase. At its ends this countershaft carries pinions which mesh with gears attached to the driving clutches of the front wheels. The cylinders of the motor carry copper water jackets, the exhaust valves being placed in the center of the head, while eight small automatic inlet valves are placed round it in a circle. Both the cylinders and the pistons are of steel. The maximum engine speed is 1,200 r. p. m., and as the direct drive gives one turn of the road wheels for every turn of the engine, the car is capable of a speed of two miles a minute. In the construction of the touring car since brought out, standard practice has been followed to a great extent; valves are mechanically operated, iron cylinders and the like. The change speed gear is mounted on the countershaft referred to and three speeds are provided by gears sliding on it, the drive being from the end of this shaft to the wheels, there being no direct connection between the latter and the crankshaft as in the racer.

A PROBLEM IN VIBRATION.

Editor THE AUTOMOBILE:

[1,097.]—Kindly tell me what it is that makes the vibration on the right side of the car so much greater than on the left. I have noticed with several different cars that the mud guards, lamps, etc., on the right side become loose much more frequently than those on the left side. I cannot myself arrive at any reason for this, but I am as sure that the fact exists as I am of my own inability to explain it. HIRAM BAINBRIDGE.

Mattoon, Ill.

The only thing we can suggest is that the greater vibration on the right is caused by the torque reaction of the motor. Most automobile engines run to the left, counter clockwise, as viewed from the seats of the car, with the result that the frame and body tend to revolve in the opposite direction, compressing the springs on the right more than those on the left, and very possibly giving rise to the vibration you describe. This is simply our idea. If it is correct, things should loosen most frequently on the left side of the few shaft-driven cars in which the motors turn opposite to the usual direction, and should loosen no oftener on one side than on the other or any chain-driven car. Perhaps some of our friends driving cars with double-chain drives and with back-handed motors will be so good as to further enlighten us.

PLACING A SMALL ENGINE IN A LARGE CAR.

Editor THE AUTOMOBILE:

[1,098.]—At what horsepower would you rate a two-cylinder, two-cycle gas engine of 4 1-4-inch bore by 3 3-4 stroke, at 1,500 r.p.m.? What arrangement (size and kind of muffler and piping) would you advise to make this engine perfectly silent? At what speed (miles per hour) would you gear a 7-passenger machine weighing about 1,400 pounds with engine mentioned above, friction transmission, and double side chain drive to 28-inch wheels? Also what size of full elliptic springs (intend to use four) would you advise for above machine, with solid rubber tires? SIMPLEX.

Seattle, Wash.

Granting that the efficiency of your motor is good, it should show 14 to 15 horsepower at this speed under favorable conditions, i.e., assuming that the motor draws in a fairly full charge and gets rid of the greater part of it when running at this rate. Use 1 or 1 1-4-inch wrought-iron pipe for the exhaust and lead it aft with as few turns as possible until the muffler is reached. State your requirements, giving motor dimensions, and the like, to a manufacturer of the latter and let him supply you with a muffler. This will be far easier and less expensive than attempting to make it yourself, although there is nothing complicated about a muffler.

It strikes us you are rather ambitious in making a seven-passenger car with such a small engine, although the car weight given is very low. We should not advise gearing the car to do more than 15 to 20 miles an hour on the high-speed, if it is intended to transport such a load. For the suspension, a pair of 36-inch springs with six leaves 1 1-2 inches wide, on the rear, and 32-inch springs with six leaves one inch wide for the forward pair, should make the car ride comfortably when loaded. These figures are not based on any particularly accurate data, and it will be found that the action of the springs will depend to a very large extent on the nature of the material of which they are made. The figures given could be increased slightly if the maximum load were always to be carried, but it would make the car ride very stiffly when empty.

WHAT IS THE CAUSE OF THIS LOSS OF POWER?

Editor THE AUTOMOBILE:

[1,099.]—Will you please answer a few queries of mine in the next issue of "The Automobile?" I have an 8-horsepower, single-cylinder runabout, and having had trouble with the motor recently had the cylinder rebored and a new piston installed. Since doing this the car has neither the power nor the speed it had before the repair was made. In reboring 1-32 inch was taken off, and the man who did the work said the car would have more power and speed than ever. Should not the connecting rod have been lengthened in order to give the same compression as before, as I note that the motor no longer has a high degree of compression as before the work was done? The valves are tight, and I have installed a new coil, as well as a new Schebler carbureter. I have done everything possible to improve the running of the car, but cannot get the power or speed out of it that it had previously. Any information you can give me will be appreciated. F. L. CLARK.

Chicago, Ill.

If the new piston were of the same length as the old one, there appears to be no reason why the connecting rod should have been lengthened in order to give the same degree of compression as formerly. But it may be that in fitting the new piston, a shorter one was procured, as this appears to be the most likely cause of the drop in compression, if it be true that the valves are perfectly tight and the piston rings make a good gas-tight fit with the cylinder walls. Assuming, however, that the piston is of the proper length and there is no leakage, it would seem very likely that the trouble is due to improper timing, either of the valves or of the ignition, in reassembling the motor. The intake valve should open just previously to, or exactly at the moment, the piston reaches the upper dead center, and should not close again until the piston has started upward on the compression stroke, 15 to 20 degrees on the crankcircle. The exhaust valve should open about an equal distance prior to the completion of the power stroke, and should close just before the inlet valve begins to open on the suction stroke. In both cases this is termed the *lead* given the valves and is essential to efficient running in any high-speed motor. Test the openings of the valves and see if they correspond to the above, or come close to it. The ignition should be set so that it can be advanced some 20 degrees or more, measuring on the crank circle—i. e., 20 degrees before the piston reaches upper dead center, and so that it can be retarded 10 or 15 degrees after passing that point. If you find that an examination of the motor verifies these details, there seems to be little doubt that the compression is at fault.

BALL THRUST BEARINGS.

Editor THE AUTOMOBILE:

[1,100.]—I am building a car of my own design in a small shop here, and I am planning to use annular bearings throughout the transmission, but I am somewhat at a loss as to what provision to make for the thrusts, since the makers advertise both thrust and radial bearings, and yet commend the use of the latter for taking thrusts—a practice that seems to be followed by many makers of high grade cars. If you can enlighten me as to the respective merits of these two types of bearings for thrust loads, and the determining factors, which call for the use of one kind or the other, I will be vastly obliged. There are not so many cars or authorities on them in this part of the world as there are in olden communities, and the consequence is that we have to secure our information at long range. MELVILLE E. TELFORD.

Melbourne, Australia.

The special thrust ball bearings you mention are considerably smaller for given loads than are the radial ball bearings used for thrust. They are, however, less suitable for high speeds and for constructions in which there is any side play, though two types are made—one for very low speeds with both races grooved, and the other for higher speeds with one race flat—to allow for slight inaccuracy. One of the races of all these bearings has a spherical seat, that it may accommodate itself as exactly as possible to the direction of the load. Evidently with this construction the least misalignment of the seat of the other race on the shaft, or of the shaft itself, will produce a rapid rotation of the spherical member, certain to cause trouble at very high speeds. The radial bearings used for thrust permit very high speeds, but must not be used in this manner for much over one-third of their radial load capacity. And for all but very light loads they are not advised for carrying both the radial and the thrust loads in the same bearing, two adjacent bearings being used, one so mounted as to receive one load while the second receives the other.

WHERE CAN LICENSES BE PROCURED?

Editor THE AUTOMOBILE:

[1,101.]—Where in New York City can application be made to obtain a chauffeur's license? R. H. W.

Brooklyn, N. Y.

To our knowledge there is no place in New York City where applications for chauffeur's licenses may be filed. Apply to the Secretary of State, Albany, direct. Blank applications, however, are usually to be had at many of the garages.

TO MAKE CYLINDER CASTINGS LIGHTER.

Editor THE AUTOMOBILE:

[1,102.]—Having built several motor trucks and wishing to construct a large truck without the usual weight and trouble of cracked, coarse-grained and pin-holed cylinders, I went to an iron expert of years standing and told him of my desire for better cylinder construction. After a year's experimental work in the melting of iron, he built me a four-cylinder engine with cylinders so light and of such apparent thinness that I at first refused to accept the engine. However, on his personal guarantee I placed it in a large truck, and after eight months of the hardest kind of usage, after being subjected to the severest kind of tests and engine overheated, I believe my friend has discovered a new process in the melting of iron that will be eagerly sought after by all manufacturers of automobile cylinders.

The following explanation will serve to show practical foundrymen that this new process will avoid the difficulties caused by the present method of melting iron for automobile cylinders.

Why is the first iron drawn from the cupola harder than the succeeding withdrawals, the iron mixture and other conditions being the same? The iron, on leaving the melting point in a cupola does so in dribs, globular in form, coming in contact with the coke on its way to the bottom. Each globule is deflecting when uniting with other dribs, at the same time absorbing sulphur and other foreign substances, which cause a great degree of hardness to the iron. This trouble is augmented by small particles of iron coming in contact with the cold blast, on its passing the tuyeres. The cold blast comes in contact with it in a comparatively finely divided state, the action of the cold blast having the effect to chill the iron, partially eliminating and combining its graphitic carbon in the iron before reaching the bottom. Owing to this defect and the sides of the cupola not having the heat equal to the melted iron, the iron is again chilled and more graphitic carbon is converted into combined carbon. By the time the first charge is down, small ducts or veins are formed, with the fuel below the melting point and by slag adhering to the fuel, the melted iron keeping the passage open in the ducts during the entire heat. As soon as formed, this passage protects the iron in its downward course from any action from the blast, hence no material change occurs in the iron on account of the cold blast. When the iron reaches the bottom, the latter being heated by the iron previously passing over it, it will not be subjected to the chill which the previous iron was accorded, and again we have less cause for variations in mixtures than we had with our first charge and melt. Considering the above explanation as facts, it seems no strange matter why affairs are thus.

For the manufacture of automobile cylinders by this process we find that the iron is very close in grain, and very soft and toolable. It is absolutely free from pin holes. The iron is sufficiently soft to caulk, and is very fluid in consistency, equal to semi-steel in tensile strength. Under this process, automobile cylinders can be made much lighter than under the present method of melting iron.

The writer would be glad to give further information to any one interested. ALLEN S. WIDEMAN.

Warsaw, Ind.

ANOTHER AUTOIST'S "IDEAL" AUTOMOBILE.

Editor THE AUTOMOBILE:

[1,103.]—I have seen in the columns of "The Automobile" at various times sets of general specifications which their authors state as representing their respective ideal cars, but none of these seem to me to be all that they might be. I am not an active participant in the sport, but have studied automobiles from a mechanical standpoint for several years, and the following specifications represent what I consider to be as near the ideal car as can be had with the present knowledge of gas engines. This ideal car would be of medium power and weight and have a seating capacity of five adults. Specifically the weight would be about 2,000 pounds. The car would ride on 34 by 3 tires in front and 34 by 4 tires in the rear, where much more than half of the work is done. The wheelbase would be about 110 inches, and the track 56 inches.

For a motor, I would have a three-cylinder, two-cycle, air-cooled, vertical engine of 30-35 horsepower, supported from the main frame at three points in the usual forward position. The drive from the motor would be a multiple-disc clutch in the flywheel, and thence, by means of an inclosed propeller shaft with one universal joint at its forward ends, to a sliding gear set in an integral casting with the bevel gear housing on the rear axle. The tube which inclosed the propeller shaft would be arranged to take the thrust and torque set up by the transmission of the power. The gear set would have four speeds ahead and one reverse, direct drive being had on the third speed. The rear axle would be of the floating type.

Th frame would be of pressed alloy steel, of channel section, with a drop in front of the rear axle. It would be supported on semi-elliptic springs in front and three-quarter platform springs in the rear.

The frame would be of pressed alloy steel, of channel section, with would be made up of the usual clutch, accelerator, and brake pedals, only the clutch and brake pedals would be reversed for convenience. The change gear and emergency brake levers would operate on concentric quadrants, the one the full gate type, and the other of the usual ratchet pull-up form. The throttle and spark levers would operate on a stationary sector on top of the steering wheel, with the throttle lever long enough to reach to the rim of the steering wheel. Steering would be wheel-actuated, with a fully adjustable worm and unit, all connecting links being joined by ball-and-socket joints, and the cross connection link lying in back of the front axle, where it is protected from harm.

I would use a dual system of ignition, one system being operated from storage batteries and the other operated from a low-tension magneto with coil, the whole so arranged that either or both systems may be used at the will of the operator.

While my motor and control location do not conform to common practice, they seem to me to be the simplest and most convenient, and in the case of the motor, as efficient as almost any of the modern cars. FRED B. FAY.

Worcester, Mass.

FURTHER DATA ON IGNITION ECONOMY.

Editor THE AUTOMOBILE:

[1,104.]—The case of the dry battery vs. the magneto is very well presented in the letters of E. Leeds Powell and Herbert L. Towle in your recent issues. As Mr. Towle says, if the dry battery were called upon to furnish only the current necessary for ignition, it would last long enough to answer every ordinary purpose, even without considering the possibility of making batteries that would outlast those now in use. We understand that the Semi-Dry Battery Co., of Newark, make a battery in which the chemicals are contained in a thin paste, instead of being absorbed in the blotting paper, as in the ordinary construction. Possibly this is the battery which Mr. Powell has in mind. Its makers claim that while its capacity is perhaps no greater, it does not dry out as soon as other kinds.

A consideration which is not alluded to by Mr. Powell or Mr. Towle is the fact that when contact is made and broken mechanically, the current required for this purpose must be stronger than that required to make a spark. The Atwater-Kent spark generator is the result of a great deal of research and experiment with the view of consuming the smallest possible current, and the results obtained with it are due, not simply to the fact that only one spark per ignition is made, but also to the fact that contact is made and broken mechanically by a shaft driven from the engine; so that it takes place with equal positiveness, whatever the strength of the battery may be. In addition, the duration of the contact is extremely brief, and is constant, regardless of the engine speed, though capable of being adjusted by the operator to suit the

strength of the battery. Users of this device report mileages all the way from 1,000 to 3,000 or more in service on six ordinary dry cells. In view of these facts, we believe we have come as near as possible to the ideal method of economizing battery current.

Philadelphia, Pa. A. ATWATER KENT.

EFFICIENCY OF THE FOUR-WHEEL DRIVE.

Editor THE AUTOMOBILE:

[1,105.]—Will you kindly give me space in your next issue of "The Automobile" to answer the question, "What is the efficiency of the four-wheel drive," as asked in your communication No. 1046, published in the December issue? I have had practical experience with a four-wheel driven auto, and have come to the conclusion that the four-wheel drive is the only practical method of applying power to a vehicle.

In the first place from 25 to 40 per cent. of the power is saved; second, the vehicle will not slough or skid in mud, snow or sand. I consider this a very important item, as sloughing is the cause of numberless bad accidents; third, it does not wear out only about half as many tires, for the reason that when you apply the power on all four wheels they turn, and the machine moves, and the wheels do not skid, as they do very frequently on a rear-wheel drive, thereby grinding off the tires; fourth, the mechanism of a four-wheel drive will outwear that of any other machine, for the reason that all back chuck caused by striking obstruction in front is eliminated, as the driven wheels climb over the obstruction rather than bumping into it.

I am running a four-wheel drive under a twenty-horsepower, two-cylinder motor geared to run 1,200 revolutions a minute empty, the power is reduced to permit the vehicle to run thirty miles per hour. With this machine with 30-inch wheels, weighing 2,700 pounds loaded with nine people averaging 140 pounds each, I have climbed a 10 per cent. grade 600 feet ong, on the direct speed.

Is there a rear-wheel driven machine on the market with the same rate per horsepower which will do the same work? The machine I am driving is manufactured by the Four Traction Auto Company, of this city. ERNST ROSENBERGER.

Mankato, Minn.

DISAGREES WITH MR. FAY ON CARBURETION.

Editor THE AUTOMOBILE:

[1,106.]—It is greatly to be regretted that anyone who knows so much about certain phases of automobile engineering as does Mr. Thos. J. Fay should jeopardize his reputation with those who are well informed and mislead those who are not by such erroneous statements and poor English as appeared in his article in the issue of January 2.

Mr. Fay ought to know by this time that the richness of the mixture increases with increasing speeds unless special provision, such as the modern auxiliary air valve, is made to prevent it; that the scavenging effect is better at high than at low speeds because of the greater momentum of the issuing gases during the expulsion stroke; that it is no more difficult to time the spark properly at high than at low speeds, but that for a given rate of flame propagation there is a certain piston speed, beyond which it is inexpedient to run because the ignition cannot be advanced sufficiently to give full combustion without causing too much back pressure toward the end of the compression stroke; and that it is the product, not the sum, of torque and speed that determine the horsepower.

An abridged dictionary will tell Mr. Fay that it is "constriction," not "depression," that is required in the intake pipe, where the nozzle is located, and that to "combust" is not by any means to "burn."

Time and space limitations preclude anything like an exhaustive enumeration of the lesser errors, but the foregoing are ample to indicate what might be considerately designated as the carelessness of utterance which mars what could have been made an excellent article. CECIL P. POOLE,

New York. Editor, "Power."

AN AUTOIST TAKES MR. FAY TO TASK.

Editor THE AUTOMOBILE:

[1,107.]—As I am a constant reader of your paper, I respectfully ask your privilege to differ with Mr. Thos. J. Fay on one point, in his article, "The Fuel System of Automobiles." He claims that the needle valve for adjusting the flow of gasoline in a carbureter is of no use at all. He says, after two years' trial, he finds it serves no useful purpose at all; in fact, it does some harm, as it eliminates the true nozzle effect. I will agree that if a carbureter has been fitted to a particular engine by getting the opening in the nozzle just right, which can be accomplished only by many trials and with the use of a brake, satisfactory results may be obtained. But should such carbureters be furnished by the different makers for use with different engines, would not the repair men have a pleasant time getting them properly adjusted? I have also found the needle valve a good friend when gasoline of different density is used and when the float has become a little "cloggy," for it is then but the work of a moment to slightly cut down the opening of the nozzle, when the same amount of fuel can be had without further trouble.

Now it is just as easy to locate the needle valve between the float chambers and the nozzle (as some makers do), in which position I am sure he will agree it does not interfere with the nozzle effect in the least. It makes possible the use of as clean a mixture as the engine will operate on successfully, which in turn means a cool engine and less gasoline bills.

The fact that such builders as Franklin, Duryea, Thomas, and many others of unquestioned reputation use this form of adjustment would seem to indicate that it must be of some use, at least.

Phoenixville, Pa. LEWIS T. RHOADES.

ANOTHER PHASE OF "POLISHED vs. UNPOLISHED."

Editor THE AUTOMOBILE:

[1,108.]—Brass, nickel, and painted lamps have had their innings in issues of "The Automobile," October 17 and December 19. Each have their respective merits. It must be acknowledged that there is no substitute for clean brass. Now, Mr. Manufacturer, you equip your cars with elegant bodies, especially the limousine, using many permanent brass fixtures and fittings fastened directly against elegant upholstering, trimmings, or painting. These fixtures are not exempt from tarnishing, and tarnished brass was well compared to a dirty linen collar.

Metal polish is most detrimental to fine paint or fabric. Lamps can be removed and satisfactorily polished, but what is to be done with these many permanent brass parts inside and outside of sensitive finished bodies? True, some can be partly polished by holding a clean cloth next to the part liable to permanent injury, but this is like the man who cleans his shoes and neglects the heels.

I believe that the experienced men in this special department ought to be able to overcome this evil, and if there is no fit substitute, they can at least avoid much unnecessary display of brass, as the finest carriages do not require a lot of brass to give them elegance. M. G. AUGSPURGER.

Cincinnati.

WILL J. G. C. EXPLAIN THOSE OIL FIGURES?

Editor THE AUTOMOBILE:

[1,109.]—In your issue of January 2, J. G. C., of East Orange, gives the cost of running his automobile 6,000 miles. It is very interesting, but presents nothing out of the ordinary except that part wherein it is stated that he averaged 387.09 miles to a gallon of cylinder oil. This is so obviously an error that I hope I may be permitted to ask him to throw a little light on the subject. I am running a car similar to his in all respects but one—a runabout instead of a touring car—and when I average 100 miles to a gallon I think I am doing well. And I know lots of others who think the same. MUNCH HAUSEN.

New York City.

"NATURE-FAKING" AND THE "FOUR vs. SIXES."

Editor THE AUTOMOBILE:

[1,110.]—Apropos of the six versus four-cylinder controversy, one correspondent says, "Let us look back to Nature," a horse has four legs and not six." Continuing the "nature faking," how about the airships? They use motors having eight, twelve, and sixteen cylinders, while birds have only two! Is it because flying insects have six legs and four wings? Submarines should have no cylinders at all; only turbines being au fait; but they will get there just the same. Has Maxwell his eye on the centipede? Next!

Rochester, N. Y. E. T. BIRDSALL.

SOMETHING FOR MR. SHANKS TO ANSWER.

Editor THE AUTOMOBILE:

[1,111.]—I noticed in your issue of December 19, that C. B. Shanks takes exception to the comparison by a four-cylinder enthusiast of what a horse can do with four legs, and brings forth the ostrich as an exponent of the two-cylinder. Does he take into consideration the comparative wheelbases of the two "birds" when it comes to smooth running? J. MURRAY PAGE.

Los Angeles, Cal.

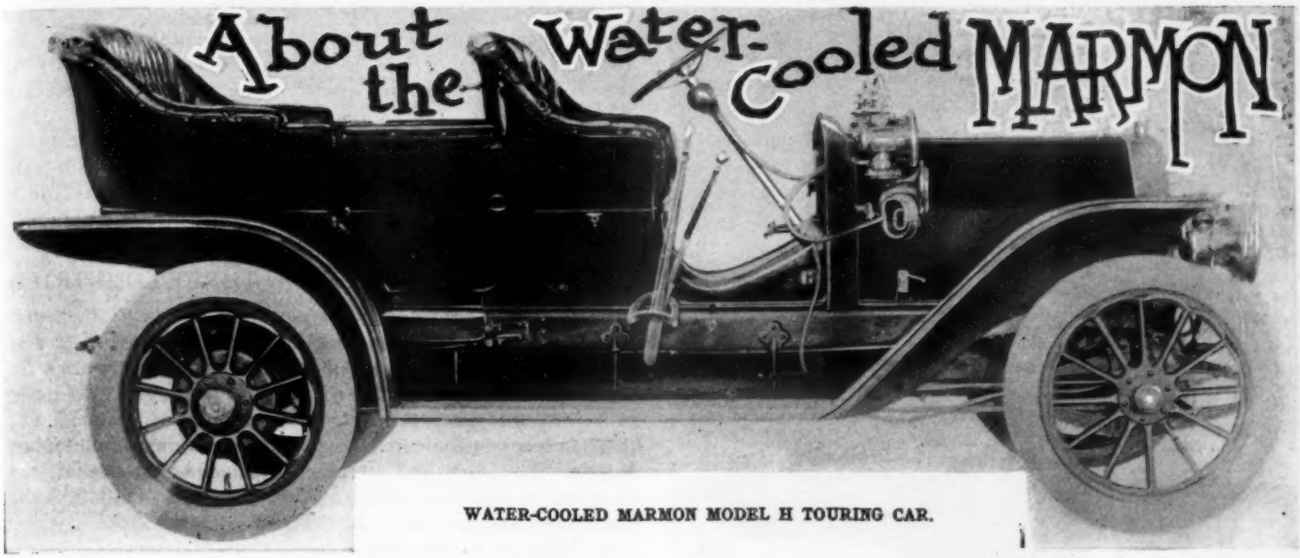
A HELPING HAND FOR FORD OWNERS.

Editor THE AUTOMOBILE:

[1,112.]—I have noticed on several occasions complaints from owners of the Ford runabouts about their engines using too much battery. I had this trouble for a time, but have overcome this. I will be glad to give any owner of the Fords my experience if they will write me. W. A. GRAY.

Coleman, Texas.

About the Water-Cooled MARMON



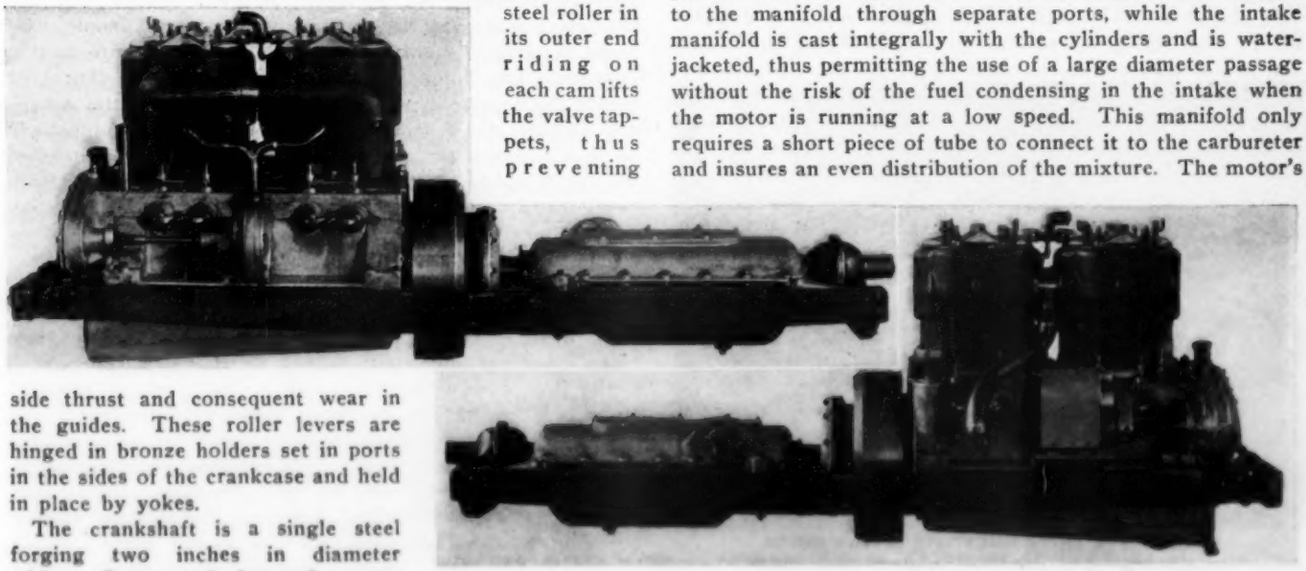
WATER-COOLED MARMON MODEL H TOURING CAR.

IN adding a water-cooled car to its line for the season of 1908, the Nordyke & Marmon Company, Indianapolis, Ind., is simply making a bid for the business of that large class that prefers a water-cooled type of motor. The success of the Marmon air-cooled car ever since it has been on the market speaks for itself, and the builders will devote more attention to this line than ever in future, as is evidenced by the improvement in motor design recently chronicled in these columns. This is the adoption of a new form of detachable cylinder head, which is a radical departure from the practice of casting the cylinders in one piece, that has numerous advantages. The numerous distinctive features that have characterized the Marmon air-cooled car have all been embodied in the chassis of the newcomer, so that there will be no difficulty of identifying either type as a Marmon product at first sight.

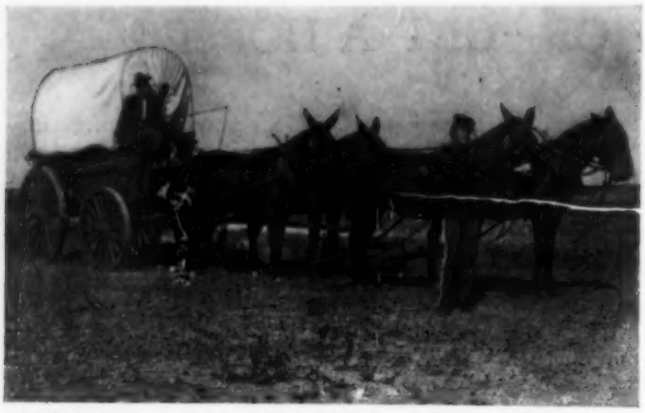
The new car is known as the Model H, and is equipped with a four-cylinder motor in which the cylinders measure 5 by 5 inches, and are cast in pairs. A special grade of iron is employed, and liberal water spaces have been provided, while the water piping is also of ample diameter, circulation being by means of a gear-driven centrifugal pump. The valves have a clear opening of 2 1-4 inches diameter and are made with taper seats, all being interchangeable. Particular attention is paid to the valve mechanism, a hinged lever with a hardened steel roller in its outer end riding on each cam lifts the valve tappets, thus preventing side thrust and consequent wear in the guides. These roller levers are hinged in bronze holders set in ports in the sides of the crankcase and held in place by yokes.

The crankshaft is a single steel forging two inches in diameter with a flange made integral on one end to receive the flywheel. The shaft itself is hollow and is mounted on Parsons white brass bearings of liberal dimensions. The connecting rods are drop-forgings and the pistons are made very long in order to give a smooth-running motor at high speeds and prevent excessive side thrust against the cylinder walls due to the short connecting rods, the latter measuring 13 1-2 inches while the pistons are 7 1-2 inches long. The connecting rod big-end bearings are also made large and of the same material as the main bearings. A feature that adds greatly to the structural strength of the motor is the carrying of the cylinder fastening bolts through the crankcase so that they also form the crankshaft bearing cap bolts, thus tying the cylinders and the crankshaft together with steel. These bolts are, in reality, studs held permanently in place, so that the removal of the cylinders does not disturb the bearings, or vice versa. The nuts holding the bearing caps are set up against steel plates and not against the aluminum of the crankcase. Cooling is provided for by an improved type of cellular radiator with a large belt-driven fan directly behind it.

Two complete and entirely independent systems of ignition are provided, a high-tension magneto with the spark plugs set over the intake valves forming one, while a timer and four-unit coil supplied with current from a set of batteries and sparking through plugs set over the exhaust valves completes the other system. The exhaust gases are carried to the manifold through separate ports, while the intake manifold is cast integrally with the cylinders and is water-jacketed, thus permitting the use of a large diameter passage without the risk of the fuel condensing in the intake when the motor is running at a low speed. This manifold only requires a short piece of tube to connect it to the carbureter and insures an even distribution of the mixture. The motor's



RIGHT AND LEFT HAND VIEWS OF THE MARMON UNIT POWER-PLANT.



PRAIRIE SCHOONER FORMERLY USED BY LIEUT. GIMPERLING.

HOW THE AUTO AIDS UNCLE SAM.

Lieutenant Gimperling, 21st Infantry, U. S. A., evidently does not place overmuch stock in the saying that nothing can take the place of the army mule for getting there, for, having been detailed by General Thomas, commanding the department of Colorado, to make a progressive military map of southern Arizona, he has decided to do it in an automobile and has selected a Stoddard-Dayton in place of the time-honored covered army wagon. Instead of averaging twenty to twenty-five miles a day, the survey will proceed at that rate *per hour*. The party consists of the lieutenant in charge, H. M. Westcott, and Arthur Harris, the driver, and they left Denver recently en route for Fort Huachuca, Ariz., a preliminary thousand-mile trip which has to be undertaken in order to reach the scene of their labors. The route there lies via Pueblo and then along the old Santa Fé trail through New Mexico and Arizona, their objective point being located in the south central part of Arizona, to reach which it will be necessary to travel through country of a nature that has done much toward earning the army mule his reputation of being able to get there, for prior to the advent of the automobile the mule and the broncho were the only animals of transport sufficiently hardy to be able to withstand the rigors of such work as it entails.

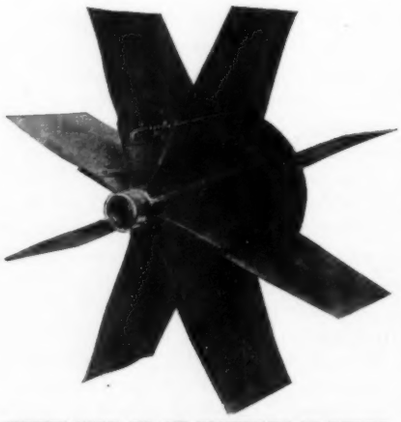
There a detail of troopers and a mess-wagon will be assigned them as the work, which consists of making a topographical map of southern Arizona, will require several months for its completion. The Stoddard-Dayton car employed is not the property of the army, but is owned by Mr. Westcott. It will be used for the entire trip, and as it is the first time that an automobile has ever been employed for the purpose, the outcome will be watched with interest, particularly by General Thomas. who granted its use.

LIEUT. GIMPERLING IN STODDARD DAYTON ON THE WAY.

A COPPER TUBE CENTRIFUGAL RADIATOR.

A distinct departure from the types of honeycomb and tubular radiators, which form the two main classes of appliances for cooling the water of an automobile engine, has been produced by the firm of Goudard & Mennesson and was offered for public inspection for the first time at the recent Paris exhibition. The G. & M. consists of a mass of copper tubes forming a circle three or four inches in depth and about four inches from front to rear, united at opposite points by a couple of collectors forming inlet and outlet. An idea of the general arrangement can be obtained from the illustration, reproduced from *L'Automobile*. To allow of the free passage of air the tubes are separated from one another by the two ribbed frames shown at left and right of the cut. The circle of tubes is held in position by a couple of pressed steel plates forming a housing, the forward plate having a central opening, the circumference of the inner ring. Within the circle a powerful centrifugal ventilator is mounted, the steel plate at the rear and radiating arms in front affording a bearing for this.

COPPER TUBE CIRCULAR RADIATOR.



VENTILATOR TO BE CENTERED IN TUBES.

The warm water arriving from the motor by the upper collector is distributed through the tubes to the lower collector, from which it passes, cooled, to the engine again. At the same time the centrifugal fan is drawing in cold air by the central opening and throwing it upon the rings of tubes. It is claimed that efficiency is so much greater by this system that instead of running the fan at two or three thousand revolutions a minute, as is often done, it can be run at 1,200 revolutions and supply all the draught required. By this system the radiator is completely independent of the hood of the motor and has the advantage of not drawing in dust on the engine, as is done when the fan is placed immediately behind the radiator. A claim of robustness is put forth on the grounds that the rings of tubes are merely clasped between the two steel plates, and that the group has a certain suppleness which prevents it suffering from road shocks. The radiator has been used on stationary engines, the fan being driven by belt off the engine flywheel.

"To instantly locate a knock beyond the shadow of a doubt, borrow a stethoscope and use it on the motor as a doctor would on a patient," says a young auto engineer who is also an M.D. Of course, every autoist cannot borrow such an instrument, and the majority would not know how to use it if they could, but the facility and certainty with which it distinguished a knock as being in the wrist pin of a certain cylinder, all other tests failing, was certainly amazing.

LETTERS INTERESTING AND INSTRUCTIVE

LAYING UP A CAR FOR THE WINTER.

Editor THE AUTOMOBILE:

[1,093.]—I would thank you very much for some information on the following. In laying up my two cars for the winter in my suburban home on Long Island, both of which are of the same make and both two opposed cylinder engines, I ask: If I open the pet cocks in the radiators, will it completely exhaust the water from the radiators and the cylinders, or whether enough might remain to cause freezing and damage. Again in jacking up the car, taking the weight from the tires, is it better to allow them to be fully inflated or to deflate the tires, or only partially so? Also, will gasoline left in the tank freeze in low temperature? Also, would you suggest in allowing the lubricating oil to be left in the oiler or withdraw same? Should the spark plugs be removed from the cylinders and a small quantity of kerosene put in to prevent rust? In short, any information that you can give me as to minor details of laying up a car for the winter will be fully appreciated, and I think beneficial to the owners who care for their own cars.

Trusting you to answer this in your most instructive column of "Letters Interesting," I remain, T. C. SNEDEKER.

New York City.

Putting a car out of commission for the winter may consist of anything from running it into the barn and closing the door, to a most elaborate process, but it is not advisable to adopt the first extreme and not necessary to go to the latter. Whether the radiator petcock will drain the entire system of water or not, depends on its location. If it happens to be the lowest point in the circulating system it will, but it is advisable to open other connections, as at the pump, or other convenient point as low as possible in order to be certain of getting all the water out. We should think that it would be preferable to have the tires partially inflated, but tire experts may disagree on this point, however. Before leaving them this way, they should be removed from the rims, and if the latter show any signs of rust, this should be removed and the rims given one or two coats of shellac, the tires being replaced after this has dried. The gasoline is not at all apt to freeze at any temperature usual in this latitude, but as it constitutes an element of danger in that it is considered to greatly increase the fire hazard to any building in which it is present, it is preferable to empty the tank. This also applies to the lubricating oil, but for a different reason, namely, that the oil may thicken or gum in the tubes and be more difficult to remove in the spring. Empty the entire lubricating system and flush it out with gasoline. It is also advisable to inject a little kerosene in the cylinders, but the plugs should be replaced. Any bright steel parts that are apt to rust should be coated with grease or thick oil.

DERANGING THE VALVE-TIMING OF THE MOTOR.

Editor THE AUTOMOBILE:

[1,094.]—In letter No. 1,062, published in the January 2 issue of "The Automobile," a subscriber asks you the following: "If, in timing an engine, the two to one gear is slipped one cog either forward or backward, can the correct timing be made again with the commutator, pushing it either forward or backward?" You answer that it can, saying that moving the commutator will naturally compensate for shifting the gears. That is true as far as the ignition is concerned, but it is not also true that any change in these gears changes the timing of the valves themselves, and this cannot be corrected by moving the commutator. Would not your answer to this question be liable to cause him some trouble?

Brattleboro, Vt. CHARLES A. SMITH.

It would, unless, as we presumed to be the case at the time, it was only intended that the pinions should be revolved forward or backward, and not their camshafts, though as a matter of fact we must confess that this was something which was overlooked in answering the letter in question. If the timing gears were moved backward or forward, while attached to their respective camshafts, this would naturally move the inlet and exhaust cams one way or the other and a derangement of the valve-timing would necessarily follow.

NOT THE BATTERIES THAT ARE FAULTY.

Editor THE AUTOMOBILE:

[1,095.]—Please answer the following in "Letters Interesting and Instructive." I use a Splitdorf coil, and for some reason the dry batteries do not seem to last but a short time. I have used "Ever Ready," Columbia, and two or three other good makes. By the time they have run 300 or 400 miles they will not register more than 1 or 2 amperes. I have a single-cylinder Oldsmobile runabout. Is it the coil? Is it because the batteries are grounded too long? I have followed the instructions of the manufacturer in the length of revolution of engine in grounding batteries, 1-3 of one revolution of engine, which is a four-cycle. SCHUYLER G. FOSTER.

Allegan, Mich.

It is quite evident that the cells you have been using have not been at fault, but that the trouble is to be found either in the timer or coil, or possibly both. We presume you wish to be understood by "grounded for 1-3 of a revolution" that this is the duration of the contact employed to produce the spark, in which case it is nothing strange that you have had experience of this nature with dry cells. While makers differ on this point, 50 to 60 degrees on the crank circle is ample to allow for advancing and retarding the time of sparking, slightly more being allowed for advancing than retarding. This would be only 1-6 of a revolution, but as a matter of fact, we do not believe that as much as this is allowed on the majority of present-day cars, so that you are wasting a very large percentage of the current delivered by the batteries. The Oldsmobile runabout was not distinguished by a very advanced form of timer, and doubtless a new and up-to-date device, which could be fastened to the rear end of the camshaft most conveniently, together with the proper adjustment of the coil, would remedy the difficulty.

WHAT PREVENTS A WORM GEAR STRIPPING?

Editor THE AUTOMOBILE:

[1,096.]—Could you answer a few questions through your valuable medium "Letters Interesting and Instructive?" Some cars, foreign, I believe, employ a worm drive. My question is: Why do not these gears strip when the driven member of the transmission becomes the driver, as is the case when the power is shut off? I have before me an "ad" cut from some journal, giving an illustration of a Christie touring car. Could you, or have you, described this car (either tourist or racer) in detail? Mr. Christie has made such a radical diversion from standard lines that, while we are all familiar with its appearance, I find few people who know much about its mechanical features. All they know is that it is front drive, but when they try to enumerate, I find they do not know much more than myself. Perhaps your answer will be long, but I know you will go a long distance out of your way to oblige a writer—much more than several editors which I have in mind.

Brooklyn, N. Y. ROYAL H. WALTERS.

A number of heavy 'buses, which we believe are still in daily use in London and vicinity, are equipped with a worm drive. The same is true of the Mitchell commercial cars made in this country, and it has been reported from time to time that others were considering its adoption. The reason that these worms do not strip when driven by the car instead of driving it, is due to the fact that the pitch of the thread has been calculated to avoid this, in which respect they differ from the ordinary worm gear.

The Christie racing car which was run in the Grand Prix in France and in numerous races in this country since then, was described in detail in the issue of THE AUTOMOBILE of April 11, 1907. The transversely placed engine drives the front wheels directly through the medium of a conical friction clutch at each end of the crankshaft, so that when the car is running on the direct drive the wheels are practically on extensions of the crankshaft, universal joints being interposed to allow for relative movement, and they make one turn for every revolution of the motor. To provide a low speed forward, a small pinion attached to the center of the

crankshaft meshes with a large spur pinion on a countershaft running parallel with the former and inside the crankcase. At its ends this countershaft carries pinions which mesh with gears attached to the driving clutches of the front wheels. The cylinders of the motor carry copper water jackets, the exhaust valves being placed in the center of the head, while eight small automatic inlet valves are placed round it in a circle. Both the cylinders and the pistons are of steel. The maximum engine speed is 1,200 r. p. m., and as the direct drive gives one turn of the road wheels for every turn of the engine, the car is capable of a speed of two miles a minute. In the construction of the touring car since brought out, standard practice has been followed to a great extent; valves are mechanically operated, iron cylinders and the like. The change speed gear is mounted on the countershaft referred to and three speeds are provided by gears sliding on it, the drive being from the end of this shaft to the wheels, there being no direct connection between the latter and the crankshaft as in the racer.

A PROBLEM IN VIBRATION.

Editor THE AUTOMOBILE:

[1,097.]—Kindly tell me what it is that makes the vibration on the right side of the car so much greater than on the left. I have noticed with several different cars that the mud guards, lamps, etc., on the right side become loose much more frequently than those on the left side. I cannot myself arrive at any reason for this, but I am as sure that the fact exists as I am of my own inability to explain it. HIRAM BAINBRIDGE.

Mattoon, Ill.

The only thing we can suggest is that the greater vibration on the right is caused by the torque reaction of the motor. Most automobile engines run to the left, counter clockwise, as viewed from the seats of the car, with the result that the frame and body tend to revolve in the opposite direction, compressing the springs on the right more than those on the left, and very possibly giving rise to the vibration you describe. This is simply our idea. If it is correct, things should loosen most frequently on the left side of the few shaft-driven cars in which the motors turn opposite to the usual direction, and should loosen no oftener on one side than on the other or any chain-driven car. Perhaps some of our friends driving cars with double-chain drives and with back-handed motors will be so good as to further enlighten us.

PLACING A SMALL ENGINE IN A LARGE CAR.

Editor THE AUTOMOBILE:

[1,098.]—At what horsepower would you rate a two-cylinder, two-cycle gas engine of 4 1-4-inch bore by 3 3-4 stroke, at 1,500 r.p.m.? What arrangement (size and kind of muffler and piping) would you advise to make this engine perfectly silent? At what speed (miles per hour) would you gear a 7-passenger machine weighing about 1,400 pounds with engine mentioned above, friction transmission, and double side chain drive to 28-inch wheels? Also what size of full elliptic springs (intend to use four) would you advise for above machine, with solid rubber tires? SIMPLEX.

Seattle, Wash.

Granting that the efficiency of your motor is good, it should show 14 to 15 horsepower at this speed under favorable conditions, i.e., assuming that the motor draws in a fairly full charge and gets rid of the greater part of it when running at this rate. Use 1 or 1 1-4-inch wrought-iron pipe for the exhaust and lead it aft with as few turns as possible until the muffler is reached. State your requirements, giving motor dimensions, and the like, to a manufacturer of the latter and let him supply you with a muffler. This will be far easier and less expensive than attempting to make it yourself, although there is nothing complicated about a muffler.

It strikes us you are rather ambitious in making a seven-passenger car with such a small engine, although the car weight given is very low. We should not advise gearing the car to do more than 15 to 20 miles an hour on the high-speed, if it is intended to transport such a load. For the suspension, a pair of 36-inch springs with six leaves 1 1-2 inches wide, on the rear, and 32-inch springs with six leaves one inch wide for the forward pair, should make the car ride comfortably when loaded. These figures are not based on any particularly accurate data, and it will be found that the action of the springs will depend to a very large extent on the nature of the material of which they are made. The figures given could be increased slightly if the maximum load were always to be carried, but it would make the car ride very stiffly when empty.

WHAT IS THE CAUSE OF THIS LOSS OF POWER?

Editor THE AUTOMOBILE:

[1,099.]—Will you please answer a few queries of mine in the next issue of "The Automobile?" I have an 8-horsepower, single-cylinder runabout, and having had trouble with the motor recently had the cylinder rebored and a new piston installed. Since doing this the car has neither the power nor the speed it had before the repair was made. In reboring 1-32 inch was taken off, and the man who did the work said the car would have more power and speed than ever. Should not the connecting rod have been lengthened in order to give the same compression as before, as I note that the motor no longer has a high degree of compression as before the work was done? The valves are tight, and I have installed a new coil, as well as a new Schebler carbureter. I have done everything possible to improve the running of the car, but cannot get the power or speed out of it that it had previously. Any information you can give me will be appreciated. F. L. CLARK.

Chicago, Ill.

If the new piston were of the same length as the old one, there appears to be no reason why the connecting rod should have been lengthened in order to give the same degree of compression as formerly. But it may be that in fitting the new piston, a shorter one was procured, as this appears to be the most likely cause of the drop in compression, if it be true that the valves are perfectly tight and the piston rings make a good gas-tight fit with the cylinder walls. Assuming, however, that the piston is of the proper length and there is no leakage, it would seem very likely that the trouble is due to improper timing, either of the valves or of the ignition, in reassembling the motor. The intake valve should open just previously to, or exactly at the moment, the piston reaches the upper dead center, and should not close again until the piston has started upward on the compression stroke, 15 to 20 degrees on the crankcircle. The exhaust valve should open about an equal distance prior to the completion of the power stroke, and should close just before the inlet valve begins to open on the suction stroke. In both cases this is termed the *lead* given the valves and is essential to efficient running in any high-speed motor. Test the openings of the valves and see if they correspond to the above, or come close to it. The ignition should be set so that it can be advanced some 20 degrees or more, measuring on the crank circle—i. e., 20 degrees before the piston reaches upper dead center, and so that it can be retarded 10 or 15 degrees after passing that point. If you find that an examination of the motor verifies these details, there seems to be little doubt that the compression is at fault.

BALL THRUST BEARINGS.

Editor THE AUTOMOBILE:

[1,100.]—I am building a car of my own design in a small shop here, and I am planning to use annular bearings throughout the transmission, but I am somewhat at a loss as to what provision to make for the thrusts, since the makers advertise both thrust and radial bearings, and yet commend the use of the latter for taking thrusts—a practice that seems to be followed by many makers of high grade cars. If you can enlighten me as to the respective merits of these two types of bearings for thrust loads, and the determining factors, which call for the use of one kind or the other, I will be vastly obliged. There are not so many cars or authorities on them in this part of the world as there are in olden communities, and the consequence is that we have to secure our information at long range. MELVILLE E. TELFORD.

Melbourne, Australia.

The special thrust ball bearings you mention are considerably smaller for given loads than are the radial ball bearings used for thrust. They are, however, less suitable for high speeds and for constructions in which there is any side play, though two types are made—one for very low speeds with both races grooved, and the other for higher speeds with one race flat—to allow for slight inaccuracy. One of the races of all these bearings has a spherical seat, that it may accommodate itself as exactly as possible to the direction of the load. Evidently with this construction the least misalignment of the seat of the other race on the shaft, or of the shaft itself, will produce a rapid rotation of the spherical member, certain to cause trouble at very high speeds. The radial bearings used for thrust permit very high speeds, but must not be used in this manner for much over one-third of their radial load capacity. And for all but very light loads they are not advised for carrying both the radial and the thrust loads in the same bearing, two adjacent bearings being used, one so mounted as to receive one load while the second receives the other.

WHERE CAN LICENSES BE PROCURED?

Editor THE AUTOMOBILE:

[1,101.]—Where in New York City can application be made to obtain a chauffeur's license? R. H. W.

Brooklyn, N. Y.

To our knowledge there is no place in New York City where applications for chauffeur's licenses may be filed. Apply to the Secretary of State, Albany, direct. Blank applications, however, are usually to be had at many of the garages.

TO MAKE CYLINDER CASTINGS LIGHTER.

Editor THE AUTOMOBILE:

[1,102.]—Having built several motor trucks and wishing to construct a large truck without the usual weight and trouble of cracked, coarse-grained and pin-holed cylinders, I went to an iron expert of years standing and told him of my desire for better cylinder construction. After a year's experimental work in the melting of iron, he built me a four-cylinder engine with cylinders so light and of such apparent thinness that I at first refused to accept the engine. However, on his personal guarantee I placed it in a large truck, and after eight months of the hardest kind of usage, after being subjected to the severest kind of tests and engine overheated, I believe my friend has discovered a new process in the melting of iron that will be eagerly sought after by all manufacturers of automobile cylinders.

The following explanation will serve to show practical foundrymen that this new process will avoid the difficulties caused by the present method of melting iron for automobile cylinders.

Why is the first iron drawn from the cupola harder than the succeeding withdrawals, the iron mixture and other conditions being the same? The iron, on leaving the melting point in a cupola does so in dribs, globular in form, coming in contact with the coke on its way to the bottom. Each globule is deflecting when uniting with other dribs, at the same time absorbing sulphur and other foreign substances, which cause a great degree of hardness to the iron. This trouble is augmented by small particles of iron coming in contact with the cold blast, on its passing the tuyeres. The cold blast comes in contact with it in a comparatively finely divided state, the action of the cold blast having the effect to chill the iron, partially eliminating and combining its graphitic carbon in the iron before reaching the bottom. Owing to this defect and the sides of the cupola not having the heat equal to the melted iron, the iron is again chilled and more graphitic carbon is converted into combined carbon. By the time the first charge is down, small ducts or veins are formed, with the fuel below the melting point and by slag adhering to the fuel, the melted iron keeping the passage open in the ducts during the entire heat. As soon as formed, this passage protects the iron in its downward course from any action from the blast, hence no material change occurs in the iron on account of the cold blast. When the iron reaches the bottom, the latter being heated by the iron previously passing over it, it will not be subjected to the chill which the previous iron was accorded, and again we have less cause for variations in mixtures than we had with our first charge and melt. Considering the above explanation as facts, it seems no strange matter why affairs are thus.

For the manufacture of automobile cylinders by this process we find that the iron is very close in grain, and very soft and toolable. It is absolutely free from pin holes. The iron is sufficiently soft to caulk, and is very fluid in consistency, equal to semi-steel in tensile strength. Under this process, automobile cylinders can be made much lighter than under the present method of melting iron.

The writer would be glad to give further information to any one interested. ALLEN S. WIDEMAN.

Warsaw, Ind.

ANOTHER AUTOIST'S "IDEAL" AUTOMOBILE.

Editor THE AUTOMOBILE:

[1,103.]—I have seen in the columns of "The Automobile" at various times sets of general specifications which their authors state as representing their respective ideal cars, but none of these seem to me to be all that they might be. I am not an active participant in the sport, but have studied automobiles from a mechanical standpoint for several years, and the following specifications represent what I consider to be as near the ideal car as can be had with the present knowledge of gas engines. This ideal car would be of medium power and weight and have a seating capacity of five adults. Specifically the weight would be about 2,000 pounds. The car would ride on 34 by 3 tires in front and 34 by 4 tires in the rear, where much more than half of the work is done. The wheelbase would be about 110 inches, and the track 56 inches.

For a motor, I would have a three-cylinder, two-cycle, air-cooled, vertical engine of 30-35 horsepower, supported from the main frame at three points in the usual forward position. The drive from the motor would be a multiple-disc clutch in the flywheel, and thence, by means of an inclosed propeller shaft with one universal joint at its forward ends, to a sliding gear set in an integral casting with the bevel gear housing on the rear axle. The tube which inclosed the propeller shaft would be arranged to take the thrust and torque set up by the transmission of the power. The gear set would have four speeds ahead and one reverse, direct drive being had on the third speed. The rear axle would be of the floating type.

Th frame would be of pressed alloy steel, of channel section, with a drop in front of the rear axle. It would be supported on semi-elliptic springs in front and three-quarter platform springs in the rear.

The frame would be of pressed alloy steel, of channel section, with would be made up of the usual clutch, accelerator, and brake pedals, only the clutch and brake pedals would be reversed for convenience. The change gear and emergency brake levers would operate on concentric quadrants, the one the full gate type, and the other of the usual ratchet pull-up form. The throttle and spark levers would operate on a stationary sector on top of the steering wheel, with the throttle lever long enough to reach to the rim of the steering wheel. Steering would be wheel-actuated, with a fully adjustable worm and unit, all connecting links being joined by ball-and-socket joints, and the cross connection link lying in back of the front axle, where it is protected from harm.

I would use a dual system of ignition, one system being operated from storage batteries and the other operated from a low-tension magneto with coil, the whole so arranged that either or both systems may be used at the will of the operator.

While my motor and control location do not conform to common practice, they seem to me to be the simplest and most convenient, and in the case of the motor, as efficient as almost any of the modern cars. FRED B. FAY.

Worcester, Mass.

FURTHER DATA ON IGNITION ECONOMY.

Editor THE AUTOMOBILE:

[1,104.]—The case of the dry battery vs. the magneto is very well presented in the letters of E. Leeds Powell and Herbert L. Towle in your recent issues. As Mr. Towle says, if the dry battery were called upon to furnish only the current necessary for ignition, it would last long enough to answer every ordinary purpose, even without considering the possibility of making batteries that would outlast those now in use. We understand that the Semi-Dry Battery Co., of Newark, make a battery in which the chemicals are contained in a thin paste, instead of being absorbed in the blotting paper, as in the ordinary construction. Possibly this is the battery which Mr. Powell has in mind. Its makers claim that while its capacity is perhaps no greater, it does not dry out as soon as other kinds.

A consideration which is not alluded to by Mr. Powell or Mr. Towle is the fact that when contact is made and broken mechanically, the current required for this purpose must be stronger than that required to make a spark. The Atwater-Kent spark generator is the result of a great deal of research and experiment with the view of consuming the smallest possible current, and the results obtained with it are due, not simply to the fact that only one spark per ignition is made, but also to the fact that contact is made and broken mechanically by a shaft driven from the engine; so that it takes place with equal positiveness, whatever the strength of the battery may be. In addition, the duration of the contact is extremely brief, and is constant, regardless of the engine speed, though capable of being adjusted by the operator to suit the

strength of the battery. Users of this device report mileages all the way from 1,000 to 3,000 or more in service on six ordinary dry cells. In view of these facts, we believe we have come as near as possible to the ideal method of economizing battery current.

Philadelphia, Pa. A. ATWATER KENT.

EFFICIENCY OF THE FOUR-WHEEL DRIVE.

Editor THE AUTOMOBILE:

[1,105.]—Will you kindly give me space in your next issue of "The Automobile" to answer the question, "What is the efficiency of the four-wheel drive," as asked in your communication No. 1043, published in the December issue? I have had practical experience with a four-wheel driven auto, and have come to the conclusion that the four-wheel drive is the only practical method of applying power to a vehicle.

In the first place from 25 to 40 per cent. of the power is saved; second, the vehicle will not slough or skid in mud, snow or sand. I consider this a very important item, as sloughing is the cause of numberless bad accidents; third, it does not wear out only about half as many tires, for the reason that when you apply the power on all four wheels they turn, and the machine moves, and the wheels do not skid, as they do very frequently on a rear-wheel drive, thereby grinding off the tires; fourth, the mechanism of a four-wheel drive will outwear that of any other machine, for the reason that all back chuck caused by striking obstruction in front is eliminated, as the driven wheels climb over the obstruction rather than bumping into it.

I am running a four-wheel drive under a twenty-horsepower, two-cylinder motor geared to run 1,200 revolutions a minute empty, the power is reduced to permit the vehicle to run thirty miles per hour. With this machine with 30-inch wheels, weighing 2,700 pounds loaded with nine people averaging 140 pounds each, I have climbed a 10 per cent. grade 600 feet ong, on the direct speed.

Is there a rear-wheel driven machine on the market with the same rate per horsepower which will do the same work? The machine I am driving is manufactured by the Four Traction Auto Company, of this city. ERNST ROSENBERGER.

Mankato, Minn.

DISAGREES WITH MR. FAY ON CARBURETION.

Editor THE AUTOMOBILE:

[1,106.]—It is greatly to be regretted that anyone who knows so much about certain phases of automobile engineering as does Mr. Thos. J. Fay should jeopardize his reputation with those who are well informed and mislead those who are not by such erroneous statements and poor English as appeared in his article in the issue of January 2.

Mr. Fay ought to know by this time that the richness of the mixture increases with increasing speeds unless special provision, such as the modern auxiliary air valve, is made to prevent it; that the scavenging effect is better at high than at low speeds because of the greater momentum of the issuing gases during the expulsion stroke; that it is no more difficult to time the spark properly at high than at low speeds, but that for a given rate of flame propagation there is a certain piston speed, beyond which it is inexpedient to run because the ignition cannot be advanced sufficiently to give full combustion without causing too much back pressure toward the end of the compression stroke; and that it is the product, not the sum, of torque and speed that determine the horsepower.

An abridged dictionary will tell Mr. Fay that it is "constriction," not "depression," that is required in the intake pipe, where the nozzle is located, and that to "combust" is not by any means to "burn."

Time and space limitations preclude anything like an exhaustive enumeration of the lesser errors, but the foregoing are ample to indicate what might be considerately designated as the carelessness of utterance which mars what could have been made an excellent article. CECIL P. POOLE,

New York. Editor, "Power."

AN AUTOIST TAKES MR. FAY TO TASK.

Editor THE AUTOMOBILE:

[1,107.]—As I am a constant reader of your paper, I respectfully ask your privilege to differ with Mr. Thos. J. Fay on one point, in his article, "The Fuel System of Automobiles." He claims that the needle valve for adjusting the flow of gasoline in a carbureter is of no use at all. He says, after two years' trial, he finds it serves no useful purpose at all; in fact, it does some harm, as it elminates the true nozzle effect. I will agree that if a carbureter has been fitted to a particular engine by getting the opening in the nozzle just right, which can be accomplished only by many trials and with the use of a brake, satisfactory results may be obtained. But should such carbureters be furnished by the different makers for use with different engines, would not the repair men have a pleasant time getting them properly adjusted? I have also found the needle valve a good friend when gasoline of different density is used and when the float has become a little "cloggy," for it is then but the work of a moment to slightly cut down the opening of the nozzle, when the same amount of fuel can be had without further trouble.

Now it is just as easy to locate the needle valve between the float chambers and the nozzle (as some makers do), in which position I am sure he will agree it does not interfere with the nozzle effect in the least. It makes possible the use of as clean a mixture as the engine will operate on successfully, which in turn means a cool engine and less gasoline bills.

The fact that such builders as Franklin, Duryea, Thomas, and many others of unquestioned reputation use this form of adjustment would seem to indicate that it must be of some use, at least.

Phoenixville, Pa. LEWIS T. RHOADES.

ANOTHER PHASE OF "POLISHED vs. UNPOLISHED."

Editor THE AUTOMOBILE:

[1,108.]—Brass, nickel, and painted lamps have had their innings in issues of "The Automobile," October 17 and December 19. Each have their respective merits. It must be acknowledged that there is no substitute for clean brass. Now, Mr. Manufacturer, you equip your cars with elegant bodies, especially the limousine, using many permanent brass fixtures and fittings fastened directly against elegant upholstering, trimmings, or painting. These fixtures are not exempt from tarnishing, and tarnished brass was well compared to a dirty linen collar.

Metal polish is most detrimental to fine paint or fabric. Lamps can be removed and satisfactorily polished, but what is to be done with these many permanent brass parts inside and outside of sensitive finished bodies? True, some can be partly polished by holding a clean cloth next to the part liable to permanent injury, but this is like the man who cleans his shoes and neglects the heels.

I believe that the experienced men in this special department ought to be able to overcome this evil, and if there is no fit substitute, they can at least avoid much unnecessary display of brass, as the finest carriages do not require a lot of brass to give them elegance. M. G. AUGSPURGER.

Cincinnati.

WILL J. G. C. EXPLAIN THOSE OIL FIGURES?

Editor THE AUTOMOBILE:

[1,109.]—In your issue of January 2, J. G. C., of East Orange, gives the cost of running his automobile 6,000 miles. It is very interesting, but presents nothing out of the ordinary except that part wherein it is stated that he averaged 387.09 miles to a gallon of cylinder oil. This is so obviously an error that I hope I may be permitted to ask him to throw a little light on the subject. I am running a car similar to his in all respects but one—a runabout instead of a touring car—and when I average 100 miles to a gallon I think I am doing well. And I know lots of others who think the same. MUNCH HAUSEN.

New York City.

"NATURE-FAKING" AND THE "FOUR vs. SIXES."

Editor THE AUTOMOBILE:

[1,110.]—Apropos of the six versus four-cylinder controversy, one correspondent says, "Let us look back to Nature," a horse has four legs and not six." Continuing the "nature faking," how about the airships? They use motors having eight, twelve, and sixteen cylinders, while birds have only two! Is it because flying insects have six legs and four wings? Submarines should have no cylinders at all; only turbines being au fait; but they will get there just the same. Has Maxwell his eye on the centipede? Next!

Rochester, N. Y. E. T. BIRDSALL.

SOMETHING FOR MR. SHANKS TO ANSWER.

Editor THE AUTOMOBILE:

[1,111.]—I noticed in your issue of December 19, that C. B. Shanks takes exception to the comparison by a four-cylinder enthusiast of what a horse can do with four legs, and brings forth the ostrich as an exponent of the two-cylinder. Does he take into consideration the comparative wheelbases of the two "birds" when it comes to smooth running? J. MURRAY PAGE.

Los Angeles, Cal.

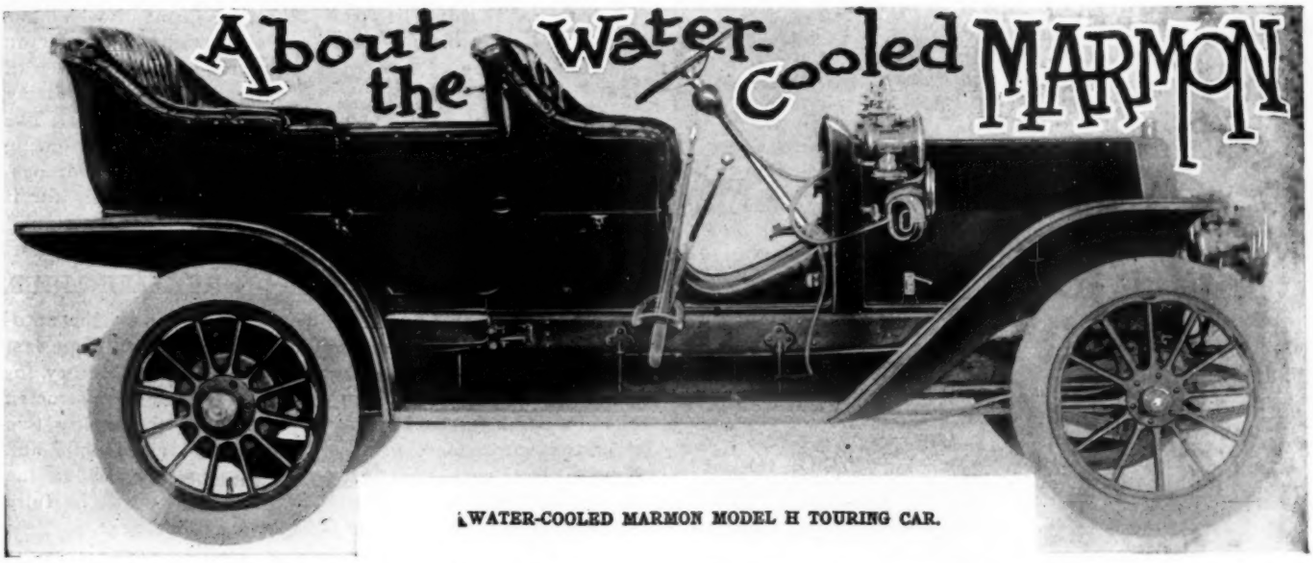
A HELPING HAND FOR FORD OWNERS.

Editor THE AUTOMOBILE:

[1,112.]—I have noticed on several occasions complaints from owners of the Ford runabouts about their engines using too much battery. I had this trouble for a time, but have overcome this. I will be glad to give any owner of the Fords my experience if they will write me. W. A. GRAY.

Coleman, Texas.

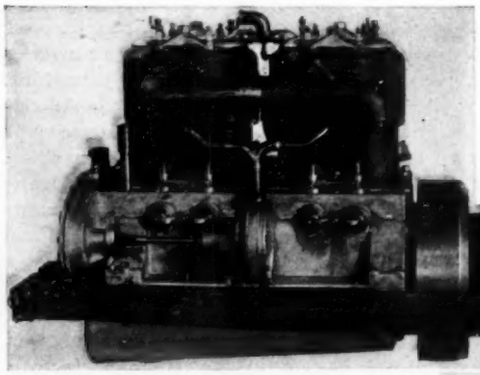
About the Water-Cooled MARMON



WATER-COOLED MARMON MODEL H TOURING CAR.

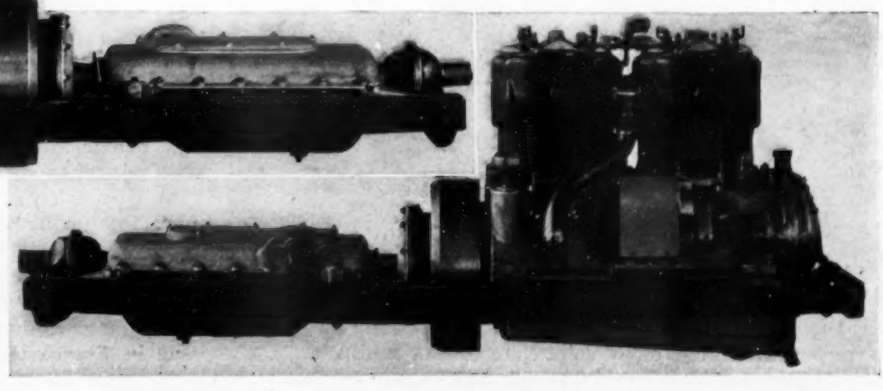
IN adding a water-cooled car to its line for the season of 1908, the Nordyke & Marmon Company, Indianapolis, Ind., is simply making a bid for the business of that large class that prefers a water-cooled type of motor. The success of the Marmon air-cooled car ever since it has been on the market speaks for itself, and the builders will devote more attention to this line than ever in future, as is evidenced by the improvement in motor design recently chronicled in these columns. This is the adoption of a new form of detachable cylinder head, which is a radical departure from the practice of casting the cylinders in one piece, that has numerous advantages. The numerous distinctive features that have characterized the Marmon air-cooled car have all been embodied in the chassis of the newcomer, so that there will be no difficulty of identifying either type as a Marmon product at first sight.

The new car is known as the Model H, and is equipped with a four-cylinder motor in which the cylinders measure 5 by 5 inches, and are cast in pairs. A special grade of iron is employed, and liberal water spaces have been provided, while the water piping is also of ample diameter, circulation being by means of a gear-driven centrifugal pump. The valves have a clear opening of 2 1-4 inches diameter and are made with taper seats, all being interchangeable. Particular attention is paid to the valve mechanism, a hinged lever with a hardened steel roller in its outer end riding on each cam lifts the valve tappets, thus preventing side thrust and consequent wear in the guides. These roller levers are hinged in bronze holders set in ports in the sides of the crankcase and held in place by yokes.

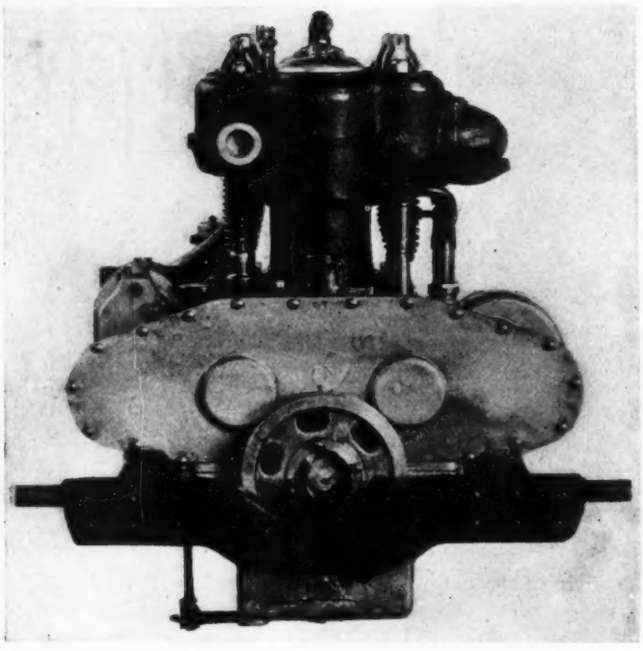


The crankshaft is a single steel forging two inches in diameter with a flange made integral on one end to receive the flywheel. The shaft itself is hollow and is mounted on Parsons white brass bearings of liberal dimensions. The connecting rods are drop-forgings and the pistons are made very long in order to give a smooth-running motor at high speeds and prevent excessive side thrust against the cylinder walls due to the short connecting rods, the latter measuring 13 1-2 inches while the pistons are 7 1-2 inches long. The connecting rod big-end bearings are also made large and of the same material as the main bearings. A feature that adds greatly to the structural strength of the motor is the carrying of the cylinder fastening bolts through the crankcase so that they also form the crankshaft bearing cap bolts, thus tying the cylinders and the crankshaft together with steel. These bolts are, in reality, studs held permanently in place, so that the removal of the cylinders does not disturb the bearings, or vice versa. The nuts holding the bearing caps are set up against steel plates and not against the aluminum of the crankcase. Cooling is provided for by an improved type of cellular radiator with a large belt-driven fan directly behind it.

Two complete and entirely independent systems of ignition are provided, a high-tension magneto with the spark plugs set over the intake valves forming one, while a timer and four-unit coil supplied with current from a set of batteries and sparking through plugs set over the exhaust valves completes the other system. The exhaust gases are carried to the manifold through separate ports, while the intake manifold is cast integrally with the cylinders and is water-jacketed, thus permitting the use of a large diameter passage without the risk of the fuel condensing in the intake when the motor is running at a low speed. This manifold only requires a short piece of tube to connect it to the carbureter and insures an even distribution of the mixture. The motor's



RIGHT AND LEFT HAND VIEWS OF THE MARMON UNIT POWER-PLANT.

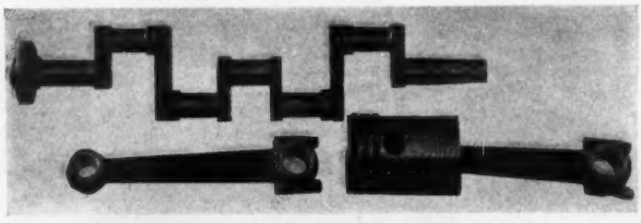


FORWARD VIEW OF THE NEW MARMON WATER-COOLED MOTOR.

rating is 40-45 horsepower, but as numerous brake tests have shown results considerably in excess of this, it does not represent its actual capacity by any means.

A multiple disk clutch of exclusive design is employed as an intermediary between the motor and the change-speed gear-set, all three of these essentials being combined in the form of a unit power plant, as shown by the accompanying photographs. The clutch consists of several bronze plates thickly studded with cork inserts faced on both sides, and alternate steel plates. The disks are inclosed in a case secured to the flywheel and run in oil. A series of coil springs engage the disks and small supplementary springs aid in disengaging the disks, when the pressure is released. It is designed to have considerable excess capacity over that of the motor and transmit the power in an extremely smooth manner. The gear-set is of the sliding type operating on the selective plan and providing three speeds forward and reverse. The pinions and their shafts are made of special steel subjected to heat treatment, and are mounted on larger annular ball bearings inclosed in an oil-tight and dust-proof aluminum case. A simple, automatic locking device placed on the outside of the housing makes it impossible to shift the gears without first disengaging the clutch, and it also insures the full meshing of the gear teeth before the clutch can be let in. A simple brake is also automatically applied whenever the clutch is released in order to slow it and the gear shaft so as to facilitate gear changing; this brake naturally does not affect the speed of the car.

Where the remainder of the car is concerned, it suffices to say that it is distinguished by the numerous features of design and construction that have become familiar through their long, successful use on the air-cooled Marmon. Some



SOME OF THE CHIEF ESSENTIALS OF THE MOTOR.

of these are the double three-point suspension in which the motor is carried on one frame and the weight of the car on another, both being free to respond to every inequality of the road; the Marmon oiling system and roller-bearing steering column, cast aluminum body and the like. The Model H is listed as a five or seven-passenger touring car, and also as a roadster carrying either two or four passengers. The chassis of the latter is built especially for it as a roadster type and embodies the latest ideas of design.

CONTINENTAL PRODUCES IN THREE COUNTRIES.

PARIS, Jan. 7.—The latest important addition to the automobile city which has sprung up and is still growing fast on a bend of the Seine outside Paris is a model factory for the Continental Tire Company. Six large shops, constructed of reinforced concrete, will, when completed, employ two thousand workpeople in the production of automobile and bicycle tires, rims and tissue for balloons. M. Bader, the commercial manager, declares that the works will be fully completed and turning out tires by October next.

In addition to the home factory at Hanover, Germany, the Continental has now two foreign factories of consider-

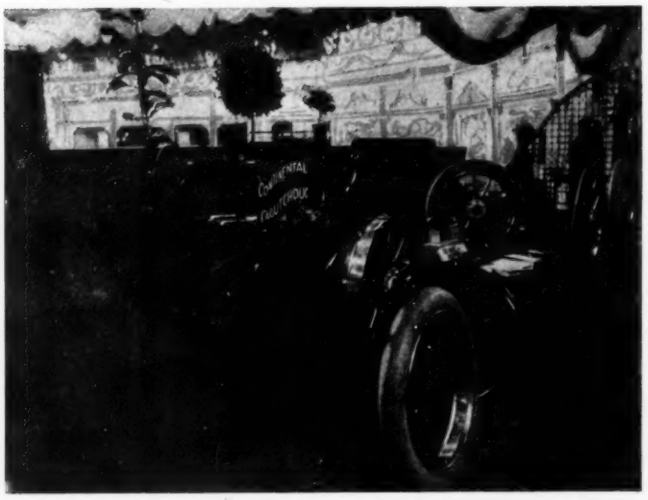


EXHIBIT OF CONTINENTAL TIRES AT RECENT IMPORTERS' SALON.

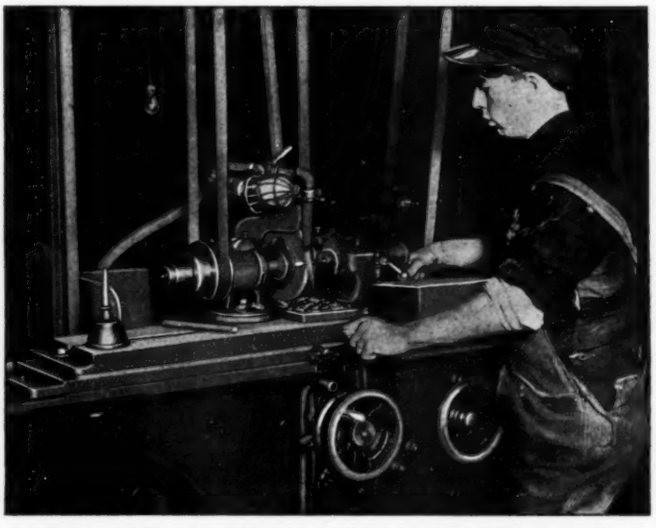
able importance, the one in the suburbs of Paris and another in Massachusetts, where a portion of the American demand is met. The Hanover factory, together with the subsidiary house at Seelze, employ 6,700 workpeople, said to be the largest number engaged by any single tire-making concern. The home factory was established in 1872, long before the automobile industry had been created, the American factory dates from 1907 and the French house will come into operation in 1908. The full line of goods handled by the company will be produced at both Paris and Hanover, the American works not yet being sufficiently extensive to meet all demands in the United States.

The making of demountable rims is now forming a very important feature of the Continental factories, this time-saving device, first tested in important racing events in 1905, being declared to be the pioneer of rims of this class. Another important branch in the Hanover factory is the fabrication of rubber tissue for balloons and airships. Important among the envelopes made by Continental was that of the ill-fated French military dirigible *Patrie*, the most successful airship ever built. It is expected that this branch of the firm's activity will be well developed at the new French factory, there being a greater demand for balloon tissue in France than anywhere else in the world.

IN THE MAKING OF A ROLLER BEARING

Probably there is nothing quite so difficult for the lay mind to grasp as the number of processes and operations that are essential to the production of even the most simple mechanical devices. Take a roller-bearing, for instance—whether considered as a whole or separated into its components, there is nothing complicated or intricate about it, and, offhand, the average man would be of the opinion that it was a correspondingly simple and easy thing to manufacture, particularly in quantities. Nothing could more effectively dispel such a notion than a trip through the plant of the Timken Roller Bearing Axle Company, at Canton, O., but as such opportunities come to few autoists, a brief review of some of the more important steps in the evolutions of the well-known anti-friction bearings made by this company will be of considerable interest.

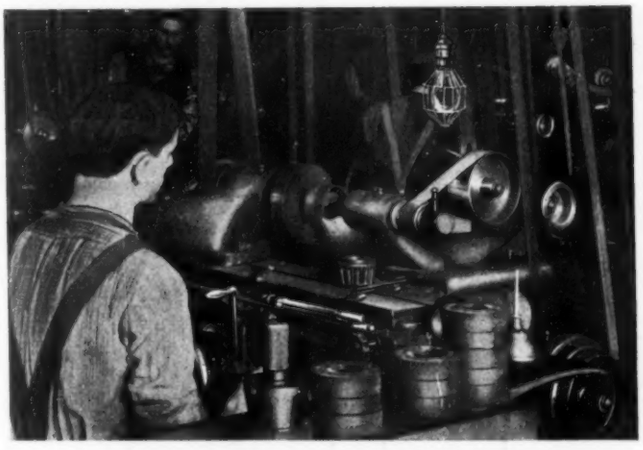
All manufacturing naturally begins with the selection of the material, and errors in this important preliminary are not only irremediable, but become magnified in the process of evolution, so that lack of due care at the outset would be apt to render the finished product worthless. After years of experience and experimenting, the Timken company settled upon an open-hearth nickel steel, low in sulphur and phosphorus, as the best material



GRINDING TIMKEN TAPER ROLLERS ON AN AUTOMATIC MACHINE.

for the rollers of their bearings. This is made to the Timken analysis and 45 per cent. of each ingot is "cropped" or rejected, in order to insure metal of suitable density and soundness. As the roller-bearing carries its load equally distributed at all contact points, all the rollers in the same bearing are subjected to an equal amount of wear, so that it is of the greatest importance that all should wear alike, uniformity of material being essential.

Though these preliminary steps are of vital importance and comprise not a little of the cost of the finished article, they are of secondary interest to the average layman, who is chiefly concerned in the machine work involved—the actual production of the bearings themselves. As is naturally to be expected in a plant of such size, every operation is carried out on a scale designed to lower the cost of production to a minimum. Compared with the price at which these bearings are sold in the market, the expense of duplicating one of them in an ordinary shop by the usual methods would cost an utterly prohibitive sum. Consequently, automatic machinery and the latest modern methods are to be found as the basis of every one of the operations through which the different parts pass. For instance, the first step after the material emerges from its various tests, is the making of the rollers, cups and cones, which are all turned out on automatic screw machines, designed to work the special Timken steel in the forms of rods and bars up to six inches.



SPECIAL MACHINE FOR GRINDING ROLLER-BEARING CUPS.

At first glance, it might seem that examination, testing and assembling would mark the end of the process and that the bearings would then be ready for service, but this is far from being the case. After being finished to shape and size, these parts are first carbonized by packing in a special carbonizing compound, consisting of animal charcoal, in iron boxes, which are heated in special furnaces and subsequently allowed to cool slowly. The parts are next heated in automatic revolving gas furnaces so that each piece of metal passing through them is subjected to the same degree of heat. From this second furnace they are suddenly quenched in oil in order to give the outside surfaces the requisite combination of hardness and toughness—in other words, qualities which fit them to withstand crushing loads as well as wear. The first process is generally known as case-hardening, for which a battery of special furnaces has been installed at the Timken plant, and the second as oil-tempering.

Here again, it might be thought that the process had now come to an end, and that only the final operations of assembling and testing remained, but it is only after the operations already described have been gone through that the most delicate part of the work of producing such bearings comes in. The hardening process referred to always causes more or less distortion of the parts, which have previously been machined closely to dimensions, but as yet have not been brought to that degree of absolute accuracy that is essential to the successful production of such a device as a properly designed anti-friction bearing. To attain this by counteracting the slight warping effect of the hardening furnaces and to get the parts down to micrometer gauge, they are placed in special grinding machines. Owing to the extreme accuracy required, as well as the fact that as little as possible

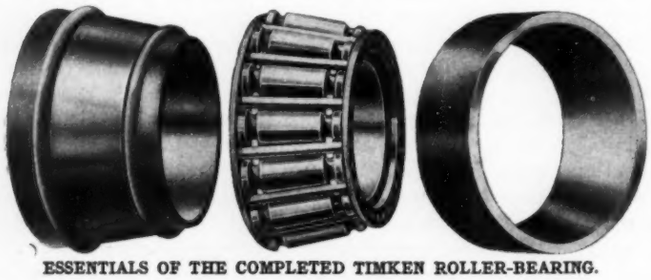
SORTING TIMKEN ROLLERS AFTER THE FIRST GRINDING.

ASSEMBLING THE FINISHED AND TESTED PARTS.

MICROMETER GAUGING THE ROLLERS FOR .002-INCH VARIATIONS.

of the specially hardened surface should be ground away, this is an operation requiring special machinery and more than the usual skill on the part of the machinist. The taper rollers are finished on automatic grinding machines.

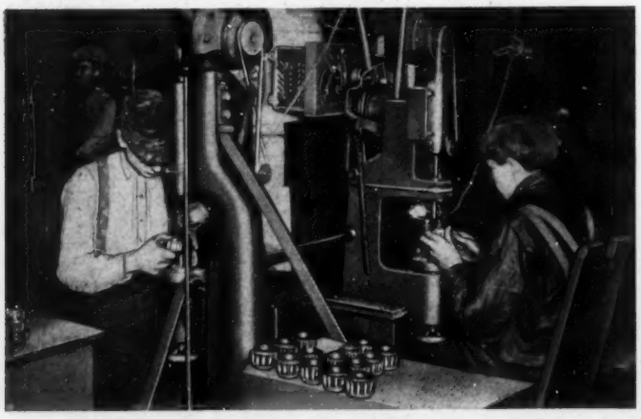
Throughout every detail of all these various processes, however, nothing is left to chance or rule-of-thumb work. Each succeeding lot of materials, and the parts into which it is transformed, is closely watched as it progresses through the different stages. In the converting boxes, 12 rollers are wired together



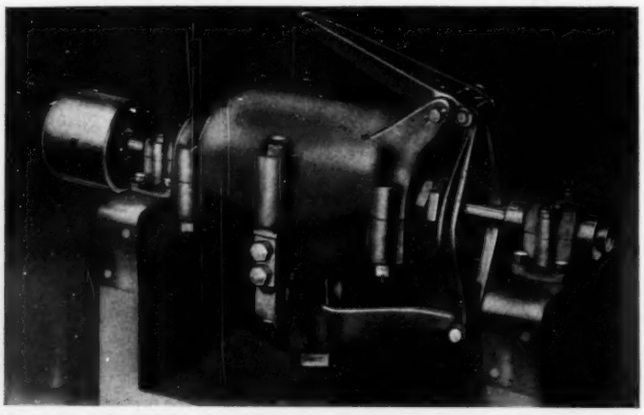
ESSENTIALS OF THE COMPLETED TIMKEN ROLLER-BEARING.

and packed in the center of each box that goes into the case-hardening furnace. These 12 rollers are test specimens, and on the completion of the heat are taken to the laboratory, where they are broken and the fractures etched with acid to determine the depth of the case-hardening—or in other words, the conversion of the surface of the parts into high-carbon steel. In this manner uniformity is insured to the greatest degree possible. After the grinding process has been completed, the finished rollers go to a tester where they are gauged for uniformity of diameter in order that only rollers very closely approximating one another in diameter at the center of the load-carrying surface, should be assembled in the same complete bearings. A difference of .002 inch causes the rollers to go into different boxes.

While these operations are being carried on in different departments of the large plant, the other essentials of the bearing are being turned out simultaneously. The cages and cage-rings are turned out in special machines, the latter being stamped and pierced in power presses. These cages carry no part of the working load, but are designed to give the individual rollers absolute freedom of travel between the cone and the cup. The rollers and cage-rings are next brought together at an ingenious riveting machine which combines the two into a circle of conical rollers loosely retained laterally by the cage-rings and studs, but accurately positioned endwise in the complete bearing assembly by the cone ribs, coacting with the roller grooves, so that each roller has the same load carrying apportionment when working. This is the next to the last step in the actual manufacturing, which consists of the assembling. After having gone through all these lengthy and intricate processes, of none of which the appearance of the simple device gives the slightest hint to the uninitiated, the original material has been converted into the finished roller-bearing. It is a product as perfect as the skill of the metallurgist, the chemist and the expert machinist, aided by modern machinery and methods, can make it, but all of this would constitute a recommendation of doubtful value to the user, if he found that the bearings gave out in actual service. Accordingly, science, skill and care are supplemented by actual trials of bearings from successive lots. These are placed in a special testing machine and subjected to stresses far beyond what they will ever be called upon to bear in actual service, so that their capacity for work is well established.



RIVETING THE CAGE RING STUDS HOLDING THE ROLLERS.



SPECIAL MACHINE FOR TESTING BEARINGS, TIMKEN LABORATORY.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

Feb. 1-8.....—Providence, State Armory, Automobile Show. Frank M. Prescott, manager.
Feb. 3-8.....—Kansas City, Mo., Convention Hall, Automobile Dealers' Association of Kansas City. W. L. Walls, secretary.
Feb. 10-15.....—Detroit, Light Guard Armory, Tri-State Automobile and Sporting Goods Association, Seventh Annual Show.
Feb. 17-22.....—Cleveland, Central Armory, Annual Show, Cleveland Automobile Dealers' Association. George Collister, manager.
Feb. 21-29.....—Newark, N. J., Orange A. C. Building, New Jersey Automobile Trade Association and New Jersey Automobile and Motor Club.
Mar. 7-14.....—Boston, Mechanics' Building and Horticultural Hall, Boston Automobile Dealers' Association. Chester I. Campbell, manager, 5 Park Square.
Mar. 9-14.....—Buffalo, Convention Hall, Sixth Annual Automobile Show, Automobile Club of Buffalo. Dai H. Lewis, manager.
Mar. 21-28.....—Toronto Canada, St. Lawrence Arena, Automobile Show. R. M. Jaffray, manager.
Apr. 5-12.....—Montreal, Canada, Arena, Third Annual Automobile and Sportsman's Show. R. M. Jaffray, Mgr.

Motor Boat Shows.

Jan. 25-Feb. 1..—Boston, Mechanics' Building, National Association of Engine and Boat Manufacturers. Chester I. Campbell, manager, 5 Park Square, Boston.
Feb. 3-8.....—Buffalo, Convention Hall, First Annual Power Boat and Sportsman's Show, auspices of Buffalo Launch Club. Dai H. Lewis, manager.
Feb. 20-Mar. 7..—New York City, Madison Square Garden, Fourteenth Annual Motor Boat and Sportsman's Show. J. H. Dressel, manager.

Race Meets, Hill Climbs, Etc.

Mar. 2-7.....—Ormond-Daytona, Fla., Automobile Club of America.
Mar. 16-21.....—Savannah, Ga., Savannah Automobile Club.
Apr. 24.....—Briarcliff Trophy Race, Westchester County, N. Y. Robert L. Morrell, Chairman.
May 4-5.....—Harrisburg-Philadelphia and Return, 150-mile Endurance Run, Motor Club of Harrisburg.
May 30.....—Bridgeport, Conn., Sport Hill Climb, Bridgeport Automobile Club.

FOREIGN.

Shows.

Jan.18-Feb.2,'08—Turin, Italy, Fifth International Automobile Exhibition, Palace of Fine Arts, Valentino Park, Automobile Club of Turin.
Mar. 21-28.....—London, Agricultural Hall, Cordingley's Show.
May 6-20.....—Moscow, Russia, International Automobile Exposition, Automobile Club of Moscow.

Races, Hill-Climbs, Etc.

April 1-13.....—Monaco Motor Boat Races and Motor Boat Exhibition, International Sporting Club of Monaco.
April 25-May 25—Industrial Vehicle Competition, Automobile Club of France.
May.....—Paris, Competition for Agricultural Automobiles, auspices of "L'Auto." (Exact date to be announced.)
May 10.....—Sicily, Targa Florio, Automobile Club of Italy.
June 1-18.....—Reliability Trials for Pleasure Cars, Automobile Club of Great Britain.
June 9-17.....—Touring Competition for the Prince Henry of Prussia Prize, Germany, Imperial Automobile Club of Germany.
June 20-July 5..—Grand Prix, Dieppe Circuit, Automobile Club of France. (Exact date to be announced.)
July 13-17.....—Ostend, Belgium, International Race Week, Automobile Club of Ostend.
July 20-30.....—Ardennes Circuit Races and Coupe de Liedederke, Automobile Club of Belgium.
Aug., 1908.....—France, Coupe de la Presse, Automobile Club of France. (Exact date to be announced.)
Aug. 29-30.....—France, Mont Ventoux Hill Climb, Vaucluse Automobile Club.
Sept. 1-8.....—French Voiturette Contest, auspices of "L'Auto."
Sept. 27.....—France, Chateau-Thierry Hill Climb, "L'Auto."

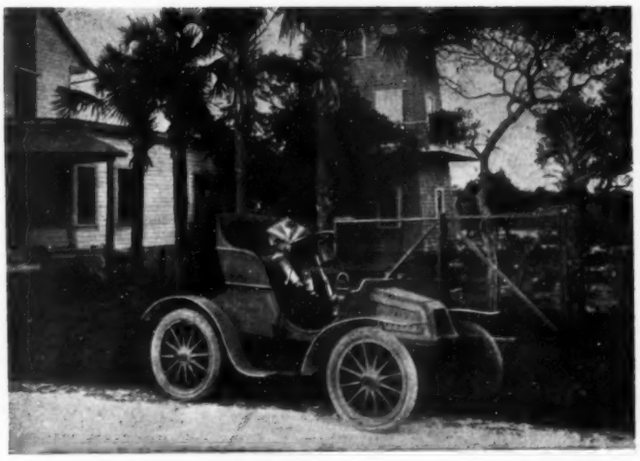


Photo by C. G. Smith, Daytona, Fla.

AN EARLY "OLD" ARRIVAL AT ORMOND-DAYTONA, FLA.

A FINE POINT IN CUSTOMS COLLECTION.

WASHINGTON, D. C., Jan. 13.—The United States Supreme Court has been asked by the Attorney General to decide whether the owner of an automobile of foreign manufacture can be required to pay duty on the machine a second time when it has been kept abroad for a year and extensively repaired. The United States Circuit Court of Appeals for the Second Circuit held that duty could be collected only on the new part of the machine, but the government contends that it should be paid on the entire article.

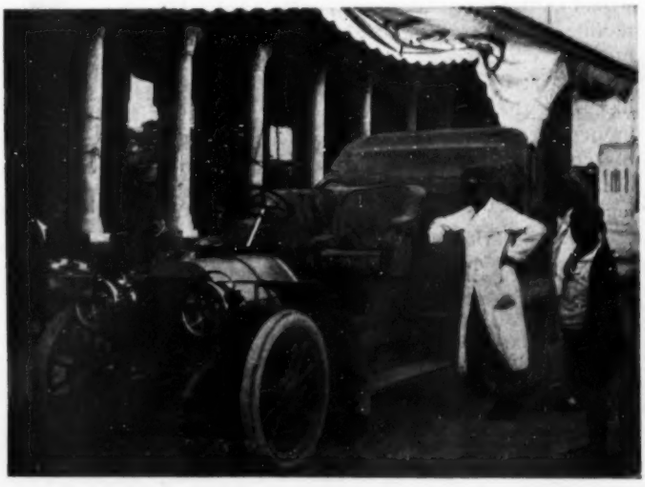
MR. MILTOUN RECEIVES TUNISIAN DECORATION.

Francis Miltoun, a frequent contributor to THE AUTOMOBILE, during his last journey in the Regency of Tunis was decorated and made an "Officier du Nichan Iftikhar" by the Bey of Tunis, for exceptional services, as the "brevet" reads.

Mr. Miltoun has voyaged much *en automobile* through Europe, and has exploited many hitherto unheard-of or neglected beauty spots among all classes of travelers. His last book, "In the Land of Mosques and Minarets," is now in the hands of his publishers (Messrs. L. C. Page & Company, of Boston).

Mr. Miltoun promises THE AUTOMOBILE an article in the near future on "Roads and Roadmaking Abroad," which, with the latest information concerning the art of modern road building as pursued in the French colonies and protectorates of old Africa, should make interesting reading.

The hotel accommodations in Tunisia are by no means backward, as the photograph sent by Mr. Miltoun plainly shows.



MR. MILTOUN AND HIS CAR IN FRONT OF TUNISIAN HOTEL.

THE AUTOMOBILE

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Knowledge the Chief Requirement of the Legislator. "One man can lead an ass to knowledge, but ten men cannot make him think," is an apt way of paraphrasing the familiar saying that is very appropriate at the moment. Leaving out of the question the strength of such ulterior influences as "constituents" and "perquisites" in deciding the passage of legislation adverse to the automobilist and the industry, it stands to reason that if the average rural "Solon" could be reasoned with and made to think a bit he would not declaim quite so loudly about downing the automobile and taxing the "rich owners" to the limit. Eighteen months' enforcement of the obnoxious Frelinghuysen law shows that by its non-reciprocal provision it has done more harm to the State of New Jersey as a whole than the money received from the extra licenses taken out can possibly compensate for. The matter of amending it in this and other particulars is now being broached, and, if the Jersey legislators can be made to think a bit, there should be no difficulty in bringing about this result.

It would be hard, indeed, to cite a better example of the beneficent effect of having some knowledge of a matter which has to be regulated by law than Mayor McClellan's recommendations to the metropolitan aldermanic body regarding the control of automobiles in New York City. With the constantly increasing number of cars in the streets of the metropolis, small things that were scarcely noticeable a few years ago have assumed the proportions of decided nuisances. Chief among these are the production of clouds of lubricating oil smoke, the constant use of sirens, and the blinding glare of large acetylene headlights at night, and in his message the Mayor laid particular stress on each one of them as something which should be forthwith abolished. If the average legislator would gain a little knowledge of the automobile and be guided by it, there would be a noticeable absence of abortive attempts at legislation.

✷

Commercial Drivers Need Not Be Skilled Mechanics. Because a French newspaper was offered the use of a taxicab company's vehicles to hold a breakdown competition open to all, but attracting no drivers of public cabs, an effort has been made in certain quarters to prove the usefulness of more skilled training for the men who are fast superseding the public hackman. A man who can adjust the platinum points on a magneto and time the ignition of a strange car in 11:18; discover and remedy a short circuit in the magneto in 1:28; discover that the carbureter nozzle had been stuffed with paper, remove it, and have his car going in five minutes—a man who can show such a record should be ashamed to be driving a taxicab. Cab companies, indeed, cannot afford to keep such men at the comparatively unskilled task of steering a small automobile rendered as automatic as it is possible for human ingenuity to make it.

Just as in modern factory practice, where a four-loom weaver knows little and cares less of the structural features of her machine, or the linotype operator confines his attention to the keyboard and the output of slugs, so the taxicab has created a demand for a class of men who may be thoroughly capable of running a car without knowing much about the operations under the bonnet. Every operating company, without exception, insists that its men shall not tinker. Their duty is to run the vehicle according to instructions, and if it fails to perform in a normal manner, to call for expert aid. Commercially it is quite inmpossible to operate any large number of automobiles except by employing unskilled or semi-skilled labor. No company can afford to employ an expert for each machine, and still less to keep tinkerers in its service. As the horse is gradually ousted from the commercial world, there will be an increasing demand for men who are nothing more than drivers.

✷

An Achievement the A.C.A. May Well Be Proud of. If, in its long career, the Automobile Club of America had not succeeded in accomplishing anything more than the successful installation of the Wheeler dynamometer, the completion of which was made the subject of a public demonstration at the large clubhouse in Fifty-fourth street last week, it would still deserve to have its name go down in history as having been the most progressive organization of its kind in this respect. There have been dynamometers of one kind or another ever since there has been anything which developed enough power to make its measurement a matter of sufficient curiosity to its builder or owner, and as was naturally to be expected, many of them have been utilized in connection with the automobile, but neither here nor abroad has there ever been such an elaborate and costly installation made for the purpose.

Large manufacturing interests occasionally go to great expense in fitting up laboratories and testing rooms to further the improvement of their own products, but even in such cases the outlay seldom exceeds that necessary to devise such an elaborate and costly assemblage of apparatus as that now permanently installed on the top floor of the Automobile Club of America's house, and which may be taken to have been designed, not merely for the benefit of the club members alone, but for that of the entire industry.

WHAT THE LEGISLATIVE BOARD OF THE A. A. A. IS DOING

CHAIRMAN CHARLES THADDEUS TERRY, of the Legislative Board of the American Automobile Association, at the recent meeting of the executive committee of the national organization, presented a report which contained much material of great moment to automobilists generally. In the course of his report Chairman Terry commented as follows:

First.—The Federal Automobile Law.—Arrangements were completed by your Board with Honorable William W. Cocks, congressman from the State of New York, for the reintroduction of the bill prepared by your committee in its effort to secure a system of Federal registration and identification of automobiles, to the end that the annoyance of the varying State requirements in these regards might be eliminated. This was so thoroughly and so promptly accomplished that this Federal bill was introduced on the very opening day of the present session of Congress, to wit, the Sixtieth Congress. The bill is known as House Bill Number 428, and was referred to the Judiciary Committee of the House. The list of the members of that committee has only recently been completed by the Speaker of the House, and forthwith upon their appointment the chairman of your committee procured from Washington the names and States respectively of the members of the committee, and here sets them forth, so that they may be on record for future reference, because your committee, and, we hope, every member of this association, will make occasion to have much to do with the said committee, both collectively and individually, before the close of the present session:

COMMITTEE ON THE JUDICIARY OF THE HOUSE OF REPRESENTATIVES.

John J. Jenkins, Chairman,	Chippewa Falls,	Wisconsin.
Richard Wayne Parker,	Newark,	New Jersey.
DeAlva S. Alexander,	Buffalo,	New York.
Charles E. Littlefield,	Rockland,	Maine.
Charles Q. Tirrell,	Natick,	Massachusetts.
John A. Sterling,	Bloomington,	Illinois.
John H. Foster,	Evansville,	Indiana.
Henry T. Bannon,	Portsmouth,	Ohio.
Reuben O. Moon,	Philadelphia,	Pennsylvania.
Gerritt J. Diekema,	Holland,	Michigan.
George R. Malby,	Ogdensburg,	New York.
Henry S. Caulfield,	St. Louis,	Missouri.
David A. DeArmond,	Butler,	Missouri.
Henry D. Clayton,	Eufaula,	Alabama.
Robert L. Henry,	Waco,	Texas.
William G. Brantley,	Brunswick,	Georgia.
Charles C. Reid,	Morrilton,	Arkansas.
Edwin Y. Webb,	Shelby,	North Carolina.

Your Board is now engaged in the preparation of letters to be sent out from the office of the association to all the clubs enrolled in the association and to each individual member of the association, as well as to any and all friends of automobilists whom we can reach. We feel that no one who will give sufficient time and thought to acquaint himself with this bill can refrain from lending his support to the measure.

The chairman and secretary of your Board expect to meet Congressman Cocks and some others whose assistance is of importance in this regard in Washington within the next ten days to further the interests of the bill.

Second.—State Motor Vehicle Laws.—The outlook for sane and reasonable State laws concerning automobiles is exceedingly good, with the prospect of the ultimate enactment by most of the States of our proposed uniform State Motor Vehicle Law very bright indeed. The one disappointing and disagreeable feature in the State law situation is presented by the incomprehensible attitude of the authorities of the State of New Jersey. There are no arguments to sustain their position in support of the obnoxious law on their statute books governing automobiles, except the frankly-confessed one that it provides revenues, and the remarkable part of the situation is that they consider that argument all sufficient. There are two provisions in the New Jersey statute, either one of which is sufficient to demonstrate the unfairness and the unreasonableness of those who advocated the passage of the measure, and both of which should elicit the hearty condemnation of every lover of fair play, whether he is an automobilist or not. Those provisions are, in a word:

(a) That a non-resident automobilist engaged in interstate travel shall not be allowed to cross a border of the State of New Jersey until he has made a trip to Trenton, paid his tribute to the State, with the emphasis on the tribute, and procured his license to exercise his natural common-law right to use the highways; and

(b) That no automobilist may traverse the streets or roads of this sovereign State of New Jersey until he has subjected himself to the humiliation of appointing as his attorney in fact a man whom he does not want to represent him, and whom he perhaps never heard of.

The law is an outrageous one, and unworthy of any self-respecting commonwealth. Every effort of the American Automobile Association and its friends should be bent to wipe from the statute books of that State this monstrous curtailment of the rights of users of the highways. So long as those provisions remain in force, every automobilist should be warned against entering the State of New Jersey and deterred from submitting himself to the indignities perpetrated by the statute of that State, and should be advised to take his tours in other sections of the country, where he can get just treatment. If the only argument for the State statute is that it produces revenue, let that argument be demolished by a demonstration that, deterring automobilists from entering the State of New Jersey, will result in a loss of a thousand dollars of money spent and left within that State for every dollar that would be paid by non-residents for license fees. This is one of the effective ways, and perhaps the most effective way, of dealing with that situation at present.

Third.—Local Ordinances.—The danger to be incurred by automobilists in deprivation of their rights, from any recurrence to the anciently asserted privilege of municipalities and other local bodies to pass ordinances of regulation to suit themselves, is obvious, and clearly a great menace. Every such attempt at the promulgation of such ordinances should be struck at by this association wherever it appears. It was supposed, and justifiably so, that when that question was once threshed out in connection with the passage of the New York State Motor Vehicle Act, it had been settled for all time; but it remained for the Park Board of the City of New York to revive it in spite of the clear prohibition of the New York State statute, and in spite of all considerations of reasonableness and equality. Common-sense, the safety to the traveling public, others as well as automobilists themselves, justice and the laws upon our statute books require that the New York City Park Board should frankly and speedily recognize its error and repeal its misconceived ordinance.

NEW JERSEY'S AUTO CLUBS TO WORK FOR A SANE LAW

NEWARK, N. J., Jan. 13.—The chief result of the meeting of the Associated Automobile Clubs of New Jersey at Trenton, N. J., last week was the passing of a resolution that W. F. Sadler, Jr., president of the associated clubs, appoint a committee to confer with Senator Frelinghuysen and others interested in the automobile law, with a view to arriving at an agreement concerning the amendments which are to be supported at the next session of the legislature. This conference will probably take place some time this month, and to it will doubtless be invited, in addition to the bill's original sponsor, Commissioner of Motor Vehicles J. B. Smith, and representatives of the grangers' and farmers' organizations, so that a complete understanding may be reached.

According to some of the press reports of the proceedings, it was stated that the delegates "voiced certain demands" to be presented to the legislature, but W. Clive Crosby, chairman of the legislative committee of the New Jersey Automobile and Motor Club, who, with J. H. Wood, represented the Newark organization at the conference, denied this emphatically.

"The intention of the meeting was not to make any demands, but to formulate the ideas which automobilists all over the State agree upon as being fair and recognized as such by all those who have carefully studied the subject," said Mr. Crosby to a representative of the Sunday *Call*.

"There was no mention made of saving the State $30,000

by the abolishment of the personal license fee, as was reported in the daily papers. We did talk over plans for saving in the administration of the automobile law, but when we discussed the subject of personal license, it was simply from the standpoint that the personal examination, so-called, as now conducted, is a farce, as every motorist who has applied for a license knows. What we desired was that a man in New York State, for example, should be able to apply by mail direct to Trenton and obtain a license without going through the formality of applying in person at one of the offices of the deputy commissioners throughout the State.

"The spirit of the meeting was entirely harmonious and the opinions expressed similar to those voiced at the meeting in Newark in December."

Those who attended as delegates the conference in Trenton last week were: New Jersey Automobile and Motor Club, W. C. Crosby and Joseph H. Wood; Northern New Jersey Automobile Club, Paterson, George A. Post; Automobile Club of Hudson County, Jersey City, J. H. Edwards and J. V. Z. Anthony; Union County Automobile Club, Plainfield, Dr. F. C. Ard; Mercer County Automobile Club, Trenton, W. F. Sadler, Jr., and James E. Gill; Atlantic City Automobile Club, Walter Edge; Camden Automobile Club, Mr. Sparks; Wildwood Automobile Club, Mr. Hammersley.

NEW YORK STATE MAY HAVE NEW LAW AND ANNUAL FEE

ALBANY, N. Y., Jan. 13.—The special legislative committee of the New York State Automobile Association, appointed by President Oliver A. Quayle, held a session in Albany on Wednesday last. Present at the session, besides the State president, were William H. Hotchkiss, of the Automobile Club of Buffalo; S. M. Butler and W. W. Niles, of the Automobile Club of America; Russell A. Field, of the Long Island Automobile Club; H. S. Stilwell, of the Syracuse Automobile Club; Charles T. Terry, chairman of the A. A. A. Legislative Board; Frederick H. Elliott, secretary of the A. A. A.; A. G. Batchelder, New York City; Chauncey D. Hakes, secretary of the State Association, and Howard Martin, of the Albany Automobile Club.

The legislative situation was gone over thoroughly, and the final results will be made public in due course of time. Messrs. Terry, Quayle and Niles were designated as a subcommittee to complete the work outlined by the special committee.

Chairman Terry Discusses an Annual Registration Fee.

Interviewed by a New York *Times* reporter, Chairman Charles Thaddeus Terry, of the A. A. A. Legislative Board, commented as follows upon the proposed new New York State law, which will contain provision for an annual registration fee:

"The prime reason for enacting an annual registration fee based upon the weight or horsepower of the cars is due to a general disposition on the part of motorists to do their share for the maintenance of good roads. The fee will not be recognized as a tax upon motor vehicles, for autoists are not disposed to acknowledge that they should be taxed exclusively for the use of the public highways, but they are willing to contribute their share of funds toward the good roads movement. Another important change will be in regard to speed regulations. In this respect we hope to embody the simple regulations of the uniform State act, which have been adopted in the Connecticut Automobile act, the most reasonable State motor law in the country.

"This states briefly that no person shall operate a motor vehicle at a rate of speed greater than is reasonable and proper, having regard to the width, traffic, and the use of the highway, and the general rules of the road, or so as to endanger property or the life and limb of any person. If it is necessary to state any specific speed rate beyond which the safety of other users of the road is likely to be endangered, a maximum of over twenty-five miles an hour in municipalities or built-up sections, when continued for half a mile, will be considered proof of negligence, and in the country a speed of over thirty miles an hour. The present New York law limits the speed rate to ten miles in thickly populated portions, fifteen miles in other localities, and twenty miles in the country. Under certain conditions these limitations are much too low, while in other cases they are too high, for an autoist in many parts of New York City would clearly be driving recklessly at six miles an hour, while in the open country he might readily travel forty miles an hour with perfect safety."

The uniform motor vehicle law, the basis of the proposed new New York statute, was prepared by the A. A. A. Legislative Board and imposes a different system of penalties than is now in vogue in the New York law.

BUFFALO CANNOT IMPOSE ANNUAL TAX.

BUFFALO, N. Y., January 13.—Members of the Automobile Club of Buffalo are particularly pleased at a decision handed down by the Appellate Division of Rochester declaring unconstitutional and invalid the ordinance adopted by the Common Council of Buffalo imposing an annual tax of $5 on all automobiles using the thoroughfares of Buffalo. This ordinance was enacted early last year, and all members of the Automobile Club were immediately advised by Secretary D. H. Lewis not to pay the tax, as the club had engaged former Supreme Court Justice Daniel J. Kenefick to attack its validity. Some, however, did pay the tax. The Municipal Court in this city decided against the municipal authorities, but an appeal was taken to the Appellate Division. The courts hold that the local measure conflicts with the State motor vehicle law.

CHAINS QUESTION SPREADS TO QUAKERVILLE.

PHILADELPHIA, Jan. 13.—At last Thursday afternoon's session of the Fairmount Park Commission, a movement was started to exclude from the park any automobile having tires fitted with chains. Final action was not taken in the matter, which was referred to the Committee on Superintendence and Police.

NEW YORK'S AUTO LEGISLATORS AT WORK.

ALBANY, N. Y., Jan. 13.—In the Assembly to-night two old anti-motor vehicle bills in a little different dress appeared. One was by Assemblyman Frederick Northrup, a Democratic printer of Poughkeepsie, who declares the big touring cars "cut the improved highways all to pieces." It is the old tax bill and amends the present motor vehicle law by calling for $5 annually from each owner.

Another Democrat, a very new Assemblyman, a law student and clerk, representing the Twentieth District of Manhattan, Patrick J. McGrath, calls for an amendment to the penal code, which provides that "any person or persons, while conducting, managing, operating, or riding in an automobile, carriage, vehicle, or any other conveyance, who shall come into contact with, or in any way injure any person or the property of another, shall immediately stop, and, upon demand, give his true name and address, and the names and addresses of the person or persons to whom such automobile or conveyance belongs, and by whom such person is employed, to the person injured, or to the first policeman on the scene, or to any citizen present; and in default of same shall be guilty of a misdemeanor and upon conviction shall be punished accordingly."

This seems to apply to street cars as well as to automobiles, and its phraseology indicates the amateur draftsman.

A.A.A. CLUBS ACCOMPLISHING MUCH THESE DAYS

RESTFUL POLICY OF A. C. OF PHILADELPHIA

PHILADELPHIA, Jan. 13.—The policy of the Automobile Club of Philadelphia is to assist the authorities wherever possible in the suppression of the unlawful use of the automobile. In this connection the club's action in relation to an accident which recently occurred in Lower Merion township, Montgomery county, makes interesting reading. Its example could be taken with profit by other clubs. Following is a copy of a letter which was sent to the authorities of Lower Merion township on the occasion mentioned:

Philadelphia, January 7, 1908.

Honorable Algernon B. Roberts, State Senator,
Philadelphia, Pa.

My Dear Senator Roberts:—

The Automobile Club of Philadelphia has instructed me to write and express to you, as representing Lower Merion Township, its approval of your course and its desire to co-operate with the authorities in every possible way in your efforts to discover the identity of the automobile driver who ran down a boy on Montgomery avenue, in Lower Merion Township, a few days since, and after injuring him severely drove off so rapidly as to prevent discovery. This organization is strongly opposed to the driving of machines at dangerously high speeds and to all forms of recklessness. The automobile club does not wish to prejudge a man or condemn him unheard, and does not therefore desire to be understood as expressing any opinion as to the guilt or responsibility for the accident in this case; but it does feel that the manly and wisest thing for a driver to do, under such circumstances, is to stop, give his name and render what assistance is possible.

We are, therefore, desired to advise you that if the commissioners of Lower Merion Township deem it advisable, the Automobile Club of Philadelphia will be glad to add the sum of fifty dollars to the reward already offered by the commissioners for evidence leading to the discovery of the driver, whose automobile was concerned in the accident above referred to. It is our wish that you use your discretion in advertising this offer of reward, and we hold ourselves in readiness to pay it over to whomever you may designate upon advice from you. Respectfully yours,

A. N. CHANDLER, President.
S. BOYER DAVIS, Secretary and Counsel.

A check for $100 sent to the Automobile Club of Delaware County to assist that organization in its efforts to secure the co-operation of the farmers in bringing about the improvement of the main country roads, is another indication of A. C. of Philadelphia methods. That they are on the right track, is the opinion of all right-minded automobilists. At the same time they are prepared to fight extortion and injustice from the drop of the hat, as not a few of the borough and township officials of the country roundabout can bear witness, after legal encounters in which they were worsted.

BUFFALO CLUB 1,127 AND STILL GROWING.

BUFFALO, N. Y., Jan. 13.—The membership of the Automobile Club of Buffalo is now 1,127, and in an appeal to members the newly elected president, Frank B. Hower, makes the following statement: "When the members of this club come to realize that our strength in controlling automobile legislation, both in the city and at Albany, depends upon the size of our membership, they will make it their business to influence every friend owning an automobile in becoming a member of the club. Remember when working for members you are working for yourself, for your influence is more powerful because your club is larger. We have now 1,127 members—let us make it 3,000. If each one will appoint himself a committee of one on membership and work, as you do in your business, the result will be astonishing. I assure you that the officers of this club are watching your interests."

The executive committee of the club consists of President Hower, E. R. Thomas and Charles Clifton.

MARYLANDERS WILL CONTEND FOR SANE SPEED

BALTIMORE, Jan. 13.—At the second annual banquet of the Maryland Automobile Club, which was held at the Hotel Belvedere last Thursday night, plans were launched for the erection of a new clubhouse. As proposed, the plan includes the erection of a building with the first floor to be rented as offices and stores. One of the sites under consideration is that occupied by the old Baltimore & Ohio Railroad building at the corner of Baltimore and Calvert streets. One of the features of the new building would be a general dining room for members.

Osborne I. Yellott presided over the banquet and acted as toastmaster. The banquet hall was as though seen through green colored goggles. The tables, in the form of a gridiron, were splashed here and there with the color of blood red tulips and Jacqueminot roses, showing bright against the snow white linen, like rear lamps of a huge touring car. The menu card was calculated to maintain the reputation of the members of the club for originality. The souvenirs were badges of black and yellow ribbons (the Maryland colors) falling from a gold model of a touring car, and from the colors dangled an auto wheel, the hub of which was a brilliant red. The wheel was of gold and made an excellent watch charm.

Among those who responded to toasts were Mayor J. Barry Mahool, who talked of "Greater Baltimore and the Automobile," saying that the automobile was a great factor in the upbuilding of the suburbs. Other speakers and their toasts were: Water Engineer Alfred M. Quick, "The Water Wagon and the Automobile;" State's Attorney Eugene O'Dunne, "Crime and the Automobile;" Chief Engineer of the State Highway Commission W. S. Crosby, "Good Roads and the Automobile;" Milton D. Greenbaum, "The Ladies and the Automobile;" William D. Gill, "Alcohol as a Fuel and Otherwise." Covers were laid for 150.

In the course of his remarks, Mr. Yellott said that the legislative committee of the club would propose an amendment to the speed laws at this session of the legislature abolishing the present limit and substituting a discretionary limit to be determined by the condition of the roadway. He urged the abolishment of toll roads and the construction of State highways, and placed the club on record as favoring a Federal license for automobiles. The use of cars by drunken chauffeurs or owners was soundly scored, and promise was made to secure legislation on this point. Lastly, he declared that the club would endeavor to secure a State commission for the government of automobiles and the issuing of licenses.

A. C. A. BANQUET WILL BE NOTABLE EVENT.

NEW YORK, Jan. 13.—The annual banquet of the Automobile Club of America, to be held in the Fifty-fourth street clubhouse on Saturday evening, January 25, will undoubtedly be the most important social event of the season in automobile circles. Instead of holding the banquet at the Waldorf or Sherry's as has been usual, the club is now in a position to entertain its guests in its own headquarters, its banqueting hall, finished in the renaissance style of François I, being one of the largest and most beautiful in the country. The gathering will, in a certain sense, be a formal celebration of the completion of the finest and most up-to-date automobile club premises in the world.

As a tribute to the fact that France is the birthplace of the modern automobile, M. Jules Jusserand, Ambassador of the French Republic, will be the guest of honor, while the other

speakers include the Hon. Chauncey M. Depew, Augustus Thomas, Hon. Job N. Hedges, and Patrick Francis Murphy.

As Delmonico has charge of the catering, this year's feast will undoubtedly prove worthy of its superb setting. The seating capacity of the hall being limited to 361 persons, and 300 reservations having already been made, the committee in charge is confident that every seat will be taken before January 16, when the lists close. The committee in charge of the banquet is composed of A. R. Shattuck, chairman; Dave H. Morris, and Orrel A. Parker.

ANNUAL BANQUET OF NEW JERSEY'S BIG CLUB.

NEWARK, N. J., Jan. 13.—Among the guests of honor at the annual banquet of the New Jersey Automobile and Motor Club, to be held February 6, probably at Achtel Stetter's, will be William H. Hotchkiss, president of the American Automobile Association, and Commissioner J. B. Smith, head of the department of motor vehicles. During this week invitations will be sent out to other prominent men who have informally expressed their willingness to be present.

Arrangements for the Newark automobile show in February, to be held under the auspices of the New Jersey Automobile and Motor Club and the New Jersey Automobile Trade Association, are now well advanced. Application blanks for space were issued last week, and returns are expected within the next few days.

ANNUAL BANQUET OF THE BINGHAMTONIANS.

BINGHAMTON, N. Y., Jan. 13.—The second annual dinner of the Binghamton Automobile Club, which was held last week at the Armory Hotel, proved by far the most enjoyable of the social functions so far attempted by that live and hustling organization. Chairman F. P. Barnes and his fellow workers on the entertainment committee laid their plans so carefully that the affair moved without a hitch and gave enjoyment in profusion to the assembled members and their guests. President Benj. F. Weldon spoke in favor of a clubhouse for the organization, and urged renewed efforts to increase the membership, and Secretary S. M. Frechie spoke of the work done in the past and the possibilities of the club's future. Mayor C. M. Slauson spoke for the city of Binghamton, and numerous civic officials were in attendance at the banquet as guests of the club.

CHICAGO M. C.'S ENDURANCE RUN, JUNE 24-27.

CHICAGO, Jan. 13.—Quick action appears to be the watchword of the newly appointed contest committee of the Chicago Motor Club. Although but three days old, it got busy and announces that the feature of the 1908 season will be a 1,200-mile reliability run continuing four days. The dates selected are June 24-27, inclusive, and the rules will require each car to do 300 miles a day, instead of 200 miles, as was required in the 600-mile reliability which was won by the Haynes in 1907. The old "hub and spoke" plan will be adopted, the contestants returning to Chicago each night. The run will come in a few weeks ahead of the Glidden and it is expected will attract many makers who also contemplate taking part in the national tour.

In addition to laying out the "long-distance reliability," the contest committee decided that the campaign of 1908 would be opened in May instead of two months later, as in previous years. The hill climb is the first thing scheduled, for May 15, which has been advanced from second place on the annual card. The economy run is also pushed forward, being booked for August 14 instead of September.

A novelty discussed by the committee was a reliability test for motor buggies. It is proposed to put on a three or four day reliability run for which cars with wheels 38 inches in diameter and over will be eligible. This will be a continuous test, starting from Chicago and running through the surrounding country for several days.

THE 1908 TOUR OF THE ALBANY A. C.

ALBANY, N. Y., Jan. 13.—The 1908 tour of the Albany Automobile Club will be held, beginning June 20, over the following route: Saturday (the 20th), Albany to Greenfield, Mass., 87 miles; Sunday, to Providence, R. I., 109 miles; Monday, to New Haven, Conn., 126 miles; Tuesday, to New York City, 80 miles; Wednesday, spent in New York; Thursday, to Waterbury, Conn., 92 miles; Friday, to Albany, 103 miles; total mileage, 597.

A committee was appointed to take direct charge of the McClure cup contest, which it was decided at a previous meeting should be over the same route and on the same dates as the club run, though under the supervision of this special committee: John Randerson, chairman; L. Melius, A. J. McClure, Walter Beattie, Dr. F. J. Cox, C. D. Hakes and C. S. Kelly. The club urges all interested persons or owners of machines to affiliate at once with it in order to secure most advantageous legislation on automobile matters.

LEE PRESIDENT OF BOSTON'S ENERGETIC CLUB.

BOSTON, Jan. 13.—Elliot C. Lee, formerly president of the American Automobile Association, and also for many years at the head of the Massachusetts Automobile Club, the pioneer organization of its kind in New England, has been elected president of the Bay State Automobile Association. Mr. Lee succeeds Lewis R. Speare, who has been president since the formation of the association three years ago, and who declined to be a candidate for reelection on account of the pressure of business duties, and because of the time required of him as vice-president of the A. A. A. and chairman of the legislative committee of the Massachusetts State Association. Harlan W. Whipple, of Andover, another ex-president of the A. A. A., was reelected vice-president, and Harry W. Knights and James Fortescue were reelected treasurer and secretary, respectively. The new board of directors consists of George W. McNear, an automobile and carriage body builder; Dr. Julian Hovestadt; Arthur P. Underhill, of the Reed-Underhill company, local agent for the Knox; J. W. Maguire, of the J. W. Maguire company, agent for the Pierce; and J. C. Kerrison. Dr. Hovestadt and Mr. Maguire are the new members. The Bay State Association is making plans for a busy season, and its officers will pay particular attention to legislative matters. The association begins the new year with a large and enthusiastic membership, and seems likely to maintain its leading position among the automobile organizations of New England.

WASHINGTON CLUB RE-ELECTS PRES. CAVERLY.

WASHINGTON, D. C., Jan. 13.—That the Automobile Club of Washington is in a flourishing condition and that it has accomplished a number of things beneficial to the automobilists of this city, was indicated by the annual reports of the officers submitted at a meeting of the club last Saturday evening. In recognition of the splendid services rendered by Robert B. Caverly, the members unanimously re-elected him president for the ensuing year. Secretary Leroy Mark was also honored with an unanimous re-election. Other officers elected were as follows: Vice-president, Harrington Mills; treasurer, Horace Chandlee; captain, F. B. Pyle; lieutenant, John Thomas. H. Chadwick Hunter, Col. C. E. Wood, W. D. West, and Arthur Newmeyer were placed on the board of governors. Steps were taken to increase the membership, and plans were made to carry on the good work of the club.

HARTFORD'S AUTO SHOW MAKES A PROMISING START

HARTFORD, CONN., Jan. 14.—It was a promising opening the show of the Hartford Dealers' Automobile Association had to-night at Foot Guard Hall. The building was artistically decorated, the crowd came in generous numbers, and sales were in progress before the exhibition was an hour old. Each exhibitor had the privilege of decorating his own space as he saw fit, and the result has been some very notable creations. There is not the uniformity seen at most of the shows, and the variety in decorating, as well as in life, seems to lend spice to the show.

Hartford being one of the pioneer automobile manufacturing cities in the country, its advantages are plainly apparent in the holding of a show. Many of the leading makes are on view, local agencies being possessed by many of the prominent concerns. The list includes these well-known names: Packard, Stevens-Duryea, Pierce-Arrow, Thomas, Corbin, Elmore, Atlas, Columbia, Ford, Pope-Hartford, Franklin, Knox, Cadillac, Oldsmobile, Autocar, Mitchell, Maxwell, Waverley, Reo, Buick, Simplex, and Isotta Fraschini.

Of course the accessory folks are on view, the names including Post & Lester, Jones Speedometer Co., Stewart & Clark Mfg. Co., Lombard Speedometer Company, G. W. Fuller, Vacuum Oil Company, Visor Knitting Company, W. H. Wiley & Sons Company, A. L. Foster & Company, Aetna Life Insurance Company, Hartford Rubber Works Company, Veeder Mfg. Co., and the Bridgeport Vehicle Company.

The men behind the show are R. D. Britton, as president of the Dealers' Association; S. A. Miner, secretary; F. W. Dart, treasurer; and E. G. Biddle as the fourth committeeman.

The banquet of the Automobile Club of Hartford is scheduled for Thursday night, at the Hotel Garde, and is in charge of a committee consisting of C. H. Gillette, H. P. Maxim, F. W. Dart, G. E. Risley, and Walter Wakefield.

GREATER PITTSBURG PREPARING FOR A GREATER SHOW

PITTSBURG, Jan. 13.—Greater Pittsburg—achieved but a few weeks ago—is to have an automobile show worthy of it. Preparations are now going forward rapidly to make the show at the Duquesne Garden, April 4-11, one of the best that has ever been held in this country. The Automobile Dealers' Association of Pittsburg, under whose auspices it will be held, had a meeting last Thursday night and completed all preliminary arrangements for the show. So far they have decided to use more space, spend more money, have more exhibitors, and call in more skilled help in making ready the big exhibition hall than they did at the first Pittsburg show.

PRES. W. N. MURRAY.

Scenic mural decorations of a high order, uniformity in inscriptions and signs, artistic and effective draping of fine material and unsurpassed arrangement in electric displays have already been determined upon. Red and white will be the prevailing colors. A touch of gold will relieve this combination. The accessory spaces will be more desirably situated than last year, for they will be against the wall and across the aisle from the automobile spaces. The main body of the hall is 340x135 feet, making a larger floor space than in Madison Square Garden, New York.

A handsome directory is now being prepared at the headquarters of the association. Prominent among the facts which it presents are these: There are 43 automobile dealers in Pittsburg; there are 82 automobile manufacturers represented in Pittsburg; there are over 3,000,000 people in the Pittsburg district; Pittsburg has more people within a radius of 75 miles than any other city in the United States, except New York and Chicago; Pittsburg has 1,000 millionaires; there are more high power automobiles used in Greater Pittsburg than in any other section of this country.

The show committee is composed of W. H. LaFountaine, Earl Kiser, Thomas I. Cochran and W. N. Murray. The Pittsburg Automobile Dealers' Association officers for this year are: President, W. N. Murray; secretary, A. L. Banker; treasurer, G. P. Moore; vice-president, W. H. LaFountaine; assistant secretary, A. E. Doherty.

CHICAGO'S NEXT SHOW WILL BE HELD IN FEBRUARY, 1909

IT was confidently expected that last year represented the first and last trials of early show dates, and that in future a return would be made to former practice, action of this nature now having been taken by both the Licensed Association and the National Association of Automobile Manufacturers, the latter at its New York meeting, January 8. Show matters came up for discussion and were referred to the show committee, which decided to recommend at the next meeting of the executive committee that the next show be held two weeks after that at Madison Square Garden, which will bring it during the first week of February, 1909. The report of General Manager S. A. Miles, on the last Chicago show, revealed the fact that, despite the unfavorable conditions, the attendance was greater than ever before.

At the request of the American Automobile Association, S. D. Waldon and W. T. White were appointed to represent the association in an advisory capacity, and Messrs. Waldon, White and H. O. Smith were appointed a committee to attend the meeting of the touring board of the A. A. A.

One of the results of the meeting of the executive committee was the election of H. E. Coffin, representing the E. R. Thomas Detroit Company, to membership, Mr. Coffin being the first man to have this honor since the initiation fee has been raised to $500. The association contemplates the establishment of a comprehensive traffic department, the subject being referred to the transportation committee of which Benjamin Briscoe is chairman.

The executive committee voted unanimously in favor of the adoption of the following resolution:

"WHEREAS, This association has been appraised of the sad death of M. L. Goss, a member of its executive committee, and one of the veteran members of the automobile industry; be it

"RESOLVED, That the Executive Committee, on behalf of the members and itself, deeply deplores the loss of an efficient associate, a man of valued counsels, a gentleman of endearing personal qualities and a friend, and that the sincere sympathy of this association, as a body, be extended to his bereaved widow and family.

Those present at the meeting were: Thomas Henderson, L. H. Kittridge, William R. Innis, R. D. Chapin, W. T. White, C. C. Hildebrand, S. T. Davis, Jr., A. L. Pope, William E. Metzger, and Charles Clifton.

SCHEDULE OF ASSETS OF THE E. V. CO.

HARTFORD, CONN., Jan. 13.—John R. Hills and F. C. Billings, of Hartford, appraisers, and Halsey M. Barrett, of Bloomfield, N. J., and Henry W. Nuckols, of Hartford, receivers of the Electric Vehicle Company, have just filed in the Superior Court, through their attorneys, Bennett & Goodwin, an inventory of the real estate, plant, merchandise, patents and book accounts of the Electric Vehicle Company in the State of Connecticut, showing a total of $1,709,603.08.

Under the head of "merchandise account," which includes finished parts, general stores, work in progress, finished vehicles, consigned cars, second-hand cars, stationery and the like, the company's inventory showed a total of $1,093,565.70, which the appraisers have reduced to $756,836. In the case of the book accounts the shrinkage has been greater proportionately, the total inventory value being $143,939.57, and the corrected value being $86,617.08.

"Schedule K" consists of the entire capital stock of the New Haven Carriage Company, of New Haven. This was acquired in 1899 for $194,000, and in the interim it has paid more than $200,000 in dividends, so that it is considered as one of the most valuable assets of the company, being listed as worth $212,500. The final schedule of the inventory refers to the company's patent holdings and is as follows:

"Selden, Patent, U. S. Patent No. 549,160.

"This patent on a road engine is considered very valuable by the officers of this company, which holds the exclusive license with the right to grant sub-licenses for the use of this patent. We are informed by the receivers that the rights of the Electric Vehicle Company in this patent have been productive of a large net income during the past five years, which income has been in excess of $500,000. This patent has still five years to run, and if the income from this source during the next five years shall equal or approximate that of the last five years, it is apparent that this patent is a valuable asset of the company." * * *

RUSHMORE DESIGN PATENTS UPHELD.

According to information supplied by the Rushmore Dynamo Works, Plainfield, N. J., their action for unfair competition which has been pending against the Manhattan Lamp Works for more than a year past, has been decided by Judge Ray in the United States Circuit Court, granting a permanent injunction against further manufacture or sale of imitations of the Rushmore lamps or parts, such as shells, rear covers, front doors, ventilators, etc., as well as enjoining the use of the name "flare front" in connection with searchlights by any other concern. The decision refers to a number of others of like nature as precedents, and in view of its sweeping effect, similar actions will be brought against other infringers who have pirated Rushmore designs.

In part, Judge Ray says in his decision:

* * * "It seems to me that when defendant copied 'Rushmore' in every detail except functions and quality of material and weight of material, etc., in short, as to appearance, he had a purpose. This purpose is made evident when we look at what he did in putting the imitation on the market. That he did defraud and injure the complainant, and to some extent the public, cannot be questioned. That his acts led to confusion in the trade and among purchasers and users is self-evident. The result could not be otherwise. A person must be held to intend the known and reasonably to be apprehended consequences or results of his own acts, when such acts are knowingly and intentionally done." * * *

E. V. STRATTON BECOMES A STUDEBAKERIST.

In line with their policy of expansion, the Studebaker Automobile Company's New York branch at Broadway and Forty-eighth street has secured the services of E. V. Stratton, who for the past year has served so well as manager of the New York Automobile Trade Asociation. Mr. Stratton will be associated with C. F. Redden in the marketing, both wholesale and retail, of Studebaker cars. Mr. Stratton is peculiarly well fitted for his new position owing to his experience in the Trade Association during the past year.

HOW THE TIREMAKER VIEWS SITUATION.

A busy year for accessory branches of the automobile industry is predicted by W. B. Miller, sales manager and secretary of the Diamond Rubber Company. The basis of this statement is a cerful analysis of reports from all sections. These reports indicate that the amount of renewal business to be done will be larger than ever before. The number of automobiles in use the past year will not be reduced. If some owners do not see fit to use their machines, the cars will pass to those who will. The number of new cars to be provided for, while not equal to that of 1907, will still reach, in the aggregate, a very large figure, making in the grand total a great extent of equipment necessary.

It is to be expected that business will be done along more conservative lines in all branches of the trade. The accepted forms of regular merchandising will prevail to a greater extent than formerly, and high quality, particularly in tires, will be demanded because of the true economy of using such products. The far-seeing dealer and consumer are both on the quality platform, and both alike working for the greatest economy in up-keep cost. That they should do so is highly desirable. The 1908 season will undoubtedly see greater discrimination in buying exercised by all automobile owners, and the general effect cannot but be healthful and beneficial to the industry as a whole.

TAXICABS FOR CHICAGO WELL UNDER WAY.

To the Elmore Mfg. Company, of Clyde, O., goes the prestige of having placed in Chicago the first taxicab service installed in the "Windy City." Owen H. Fay, the Chicago agent for the Elmore car, is the man who will introduce and operate the taxicab service. It is expected that the Elmore taxicabs will be in operation sometime within the month. The chassis are practically completed at the Elmore factory, and as soon as the bodies and tops are received, the completed cabs will be rushed on to Chicago, where stands will be established at the Auditorium Annex, the Palmer House, and the Great Northern Hotel.

The Elmore taxicab engine will measure 24-horsepower, and the running speed of the cab, fully equipped, will be 35 miles an hour, carrying five passengers.

POPE-HARTFORD ON A. C. A. DYNAMOMETER.

In giving a description of the first public trials of the recently completed dynamometer equipment of the Automobile Club of America, the fact that the first car to undergo a public test was the club's 30-horsepower Pope-Hartford was inadvertently omitted, which was unfortunate in view of the fact that the car made such an excellent showing on its tests. Though this was its first public appearance in this rôle, the club's Pope-Hartford has probably been on the rollers of the dynamometer more than any other single machine, as Dr. Wheeler employed it in breaking the crew that handles the equipment.

PALMER & SINGER TAKE ON NEW LINES.

Dropping all connection with the Matheson car, the Palmer & Singer Manufacturing Company, of New York, will shortly move into new premises opposite their present quarters, and handle the Simplex car, formerly made by the Smith & Mabley Company. In addition they will market three new P. & S. models, consisting of a four-cylinder 40-horsepower touring car, an elegant town vehicle and a six-cylinder 60-horsepower runabout. The Isotta-Fraschini Import Company, now located at Thirty-third street, will occupy space in the new building of the Palmer & Singer Manufacturing Company, on Broadway.

HOL-TAN MAKES BENZOL TEST UNDER DIFFICULTIES

A NEW YORK-PHILADELPHIA and return trip by a 25-horsepower Hol-Tan runabout, driven by Joseph Tracy, proved conclusively that benzol was practical as a fuel for automobiles, but failed to give all the scientific data that was expected of the experiment. At 9:30 on Friday morning, January 10, Joseph Tracy introduced himself to

TRACY STARTING FOR PHILADELPHIA ON HOL-TAN BENZOL TEST.

a stock of chest protectors, slipped into his furs, and climbed into the speedy-looking runabout provided by the Hol-Tan company for the test. H. J. De Bear, official observer, occupied the adjoining seat, and when Mechanician V. A. Nielson had started up the motor after a little delay, which might have happened to any gasoline-fed unit on such a cold morning, a start was made for Quaker City.

The object of the test was to ascertain the value of benzol as a substitute for gasoline without any structural changes in the equipment of the car. Benzol, a water-white liquid produced as a bi-product in the manufacture of coal gas, consists of a mixture of benzine, toluene and xylene. It commences to distil at about 176 degrees F. and does not completely distil until nearly 248 degrees F. is reached. Its calorific value is about 20,000 B. T. U. Its specific gravity is about .885 and it contains about 92 per cent. carbon and 8 per cent. hydrogen. As benzol has a higher specific gravity than gasoline and develops more power than the commonly used fuel, it was necessary to have a smaller nozzle and readjust the float. The construction of the Hol-Tan carbureter allowed this to be done merely by adjustment, the car which started out for Philadelphia being thus in all features a standard model.

Seen on his return to New York, Mr. Tracy said:

"We reached Philadelphia with no other trouble than one or two stoppages caused by impurities in our fuel. For some reason or other sand and straw had been allowed to get into the benzol and we had to stop to clean out the obstructions caused by its presence. Otherwise the car ran in a thoroughly satisfactory manner, developing more power than we could have obtained from gasoline. On Saturday morning, when ready to return to New York, we had some difficulty in replenishing our supply of fuel."

An official of the Hol-Tan Company declared that the test had been practically abandoned owing to defective ignition. "For a large portion of the run," he said, "only two cylinders were working, the trouble being with the magneto. On this account we have not been able to get all the data we hoped for, nor to prove anything very conclusive. One thing, however, is certain, the Hol-Tan car is thoroughly capable of running economically on benzol. In order to get more detailed information of a scientific nature, we shall repeat the experiment in the near future."

ONE MAKER'S PRACTICAL ROAD TEST OF THE "SIX VS. FOUR"

By GEORGE H. STROUT, Sales Manager of Apperson Bros. Automobile Company.

AS far as my observation goes, it looks as though most makers of six-cylinder cars have produced their new type of engine by adding two more cylinders of the same size as they formerly used in their four-cylinder motors, and, of course, making the necessary mechanical changes to conform to six-cylinder construction and to properly care for the increase in power. Or that they have designed an entirely new six-cylinder motor, without regard to the piston displacement of the four-cylinder motor they had formerly been building. Then, by theoretical, technical and practical tests and deductions they have tried, seriously and honestly, to determine which is the better, the "six" or the "four."

The Apperson method of trying to arrive at the exact facts in the case has varied from the method adopted by other makers. We believe that "the proof of the pudding is in the eating." We believe that both the "six" and the "four" each have advantages not possessed by the other, and it is our purpose and intent to find out, if possible, which of the two possesses the greater advantages, including power, speed, life of motor, cost of maintenance, and repairs. Some factories have turned out four-cylinder motors that have not been practically successful, and it might be "good business" for them to jump into the six-cylinder field.

For some years we have been building a four-cylinder automobile motor, with cylinders of 5 1-2-inch bore and 5-inch stroke that has been entirely successful and satisfactory to all concerned. I believe that our friends and our competitors will concede that to be a fact. The total piston area of this four-cylinder motor is 95.0334 cubic inches. Many months since we designed and built a six-cylinder motor with 4 1-2-inch bore and 5-inch stroke, total piston area, 95.4261 cubic inches. It will be noted that the total piston area of this six-cylinder motor is only .3927 of a cubic inch greater than the total piston area of our four-cylinder motor. The six-cylinder engine weighs approximately 75 pounds more than the four-cylinder engine, and occupies only 2 1-2 inches more space under the hood. Both engines go into the identically same chassis, and, barring the small additional weight of the "six" engine itself, they must propel the same number of pounds of chassis and body. We have been driving our "six" in competition with the "four" only four or five months, and so we cannot yet arrive at accurate conclusions. We believe each type has its advantages, but right now, although we are building both, we are under the impression that the disadvantages of the "six" outweigh its advantages.

As regards the relative speed that can be made by the "six" and the "four" of equal piston area, we hope to satisfy ourselves on that point at Savannah. While Edgar Apperson will race the four-cylinder "Jackrabbit" at Savannah in March, he will also have, for speed tests, a "six" of the same piston area.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

E. P. Blake, agent for the Jackson and Logan cars in Boston, has leased Horticultural Hall for the purpose of holding his own show during the week of the Boston automobile show, March 7. No admission will be charged.

I. P. Ryland, of the law firm of Ball & Ryland, has been chosen trustee in bankruptcy for the Kansas City Motor Car Company, Kansas City, Mo. Mr. Ryland was the choice of the creditors and will take charge of the plant within a few days.

Extensive alterations and improvements are being made to the factory of the Holsman Automobile Company in Chicago. Additional store space has been obtained and new tools and tool vaults installed with a view to a substantial increase in the output during the coming season.

Comet spark plugs, made by the Oakes & Dow Company, Boston, were used in the Haynes which made a clean score in the Chicago Motor Club endurance run. The makers received a strong testimonial letter from the Haynes factory last week speaking in the highest terms of the Comet plug reliability.

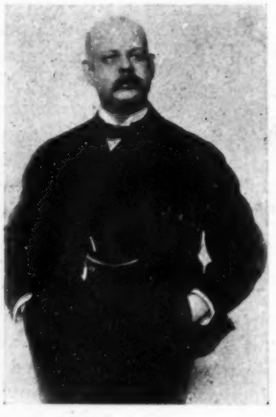
So many offers were received for the "Old English Coach," a 1908 Pope-Toledo creation, that the makers were in a quandary as to who should have it, this being finally settled by its sale to August Busch, vice-president of the Anheuser-Busch Brewing Association, St. Louis. Mr. Busch intends to tour Europe in his new car, which was one of the chief reasons for its purchase.

The Chicago offices of the Indestructible Wheel Company have just been removed to the Auto and Parts Building, 1221 Michigan avenue, where a full line of the steel stampings made by this firm will be kept on display in charge of a competent man. The sales of Indestructible steel wheels since the last Chicago show has been very large and have necessitated improvements at the factory at Lebanon, Ind.

According to E. C. Morse, the new commercial manager of the E. R. Thomas Motor Company, Buffalo, the demand for excess power in a car is greater than ever before, as witness the call of the Thomas 6-70 Special. It was originally the intention of the Thomas company to build but a small number of these cars for special customers, but the demand has increased to such an extent that this plan must necessarily be abandoned, and it is now quite likely that the original estimates for these six-cylinder cars will have to be quadrupled.

DEATH OF M. L. GOSS.

As the result of what appeared to be a trivial accident at the time, M. L. Goss, secretary of the Baker Motor Vehicle Company, died at his home in Cleveland on Friday night, January 3. On the Monday previous his hat blew off while driving home in the evening and in recovering it he was thrown down by an automobile which collided with him. He was apparently not injured and walked back to his car and drove home. Alarming complications did not set in until the following Thursday, to which Mr. Goss succumbed the following day. Like so many men who have become prominent in the automobile industry, Mr. Goss was a graduate of both the bicycle and sewing machine lines. He was born in Boston in 1849 and had made his residence in Cleveland ever since 1871, when he entered the employ of the Howe Sewing Machine Company. In 1879 he went with the White Sewing Machine Company, later becoming its secretary, which post he held until 1893. Shortly afterward he became sales manager for H. A. Lozier & Company, and was interested in the wholesaling of bicycles in Cleveland, while later he was associated with the Keating Bicycle Company, at Middletown, Conn. As soon as the electric vehicle became a factor in the automobile industry, Mr. Goss took it up and has done considerable toward its development since then. In addition to being the secretary of the Baker company, at the time of his death, he was an executive officer of the National Association of Automobile Manufacturers and treasurer of the Association of Electric Vehicle Manufacturers. He leaves a widow and a daughter and son. Ralph H. Goss. The funeral was held at the Wade Memorial Chapel on Monday last, the interment being at Lakeview Cemetery.



M. L. GOSS.

NEW AGENCIES ESTABLISHED.

The Hartford Rubber Works Company has opened a branch at 1817 Boylston street, Boston, Mass.

The South Broad Auto Company, Philadelphia, Pa., has taken the agency for the Kisselkar, made by the Kissell Motor Car Co., Hartford, Wis.

John Van Benschoten, of Poughkeepsie, N. Y., and John H. Bulkley, of Southport, Conn., will represent the Lozier line of cars in their respective districts during the coming year.

Joseph B. McKague Company, 324 Dearborn street, Chicago, Ill., have taken the western agency for the "Englebert" tires and will locate in Michigan as soon as a suitable place can be found.

Stearns cars will be handled in Boston and vicinity by Morgan A. Kent, and new salesrooms will be opened on the corner of Boylston and Gloucester streets, in the heart of the new automobile row.

The Gordon Auto Supply Company, maker of the well-known Eisner spark coils and Gordon spark plugs, has opened their new store at 1024 Bolyston street, Boston, with a full line of sundries. H. Eisner is manager.

G & J tires will be represented in Boston hereafter by the Enterprise Rubber Company, 110 Federal street, Boston. D. B. Price and R. J. Baker, who were formerly with the G & J branch store, will join the selling forces of the new representatives.

Studebaker Bros. Company, of New York, has opened a new branch at 1020 Boylston street, Boston. In connection with the salesrooms, a well-equipped garage and electric charging plant will be maintained. R. W. Daniels is the Boston branch manager.

Among the new agencies recently established by the Forest City Motor Car Company, Massillon, O., for the sale of the Jewel cars, are the following: F. A. Faller, Wilmerding, Pa.; Broad Street Garage Company, Bethlehem, Pa.; Brodess & Company, Decatur, Ill.; C. N. Albright, Akron, O.; D. W. Goble, Monon, Ind; Ray Wortham Company, Ft. Worth, Tex.

PERSONAL TRADE MENTION.

Percy Megargel, who has made three trips across the continent in an automobile, is now writing an automobile novel in collaboration with Grace Sartwell Mason, the well-known writer of short stories, and it is said the result of their labors will be the first purely American automobile romance.

Charles S. Henshaw, of Boston, who has handled the Haynes and Thomas product in New England for several years, has disposed of his interest in his Boston retail store, and signed with the Haynes factory to look after the trade exclusively appointing agencies. Boston will be Mr. Henshaw's headquarters, covering New England particularly.

The E. R. Thomas Motor Company, of Buffalo, N. Y., announces the appointment of Fay L. Faurote as advertising manager. Mr. Faurote comes to the Thomas company with five years' experience in the automobile field and will immediately inaugurate an extensive campaign of Thomas advertising, as it is Mr. Faurote's opinion that the automobile industry is on the eve of one of its most prosperous years.

Arthur N. Jervis, of New York City, the well-known and popular writer, publicity and advertising expert who has been associated with the automobile publicity end for several years past, has found the strain too much for him during the past few months and will consequently go South for a few weeks to take a much-needed rest. Mr. Jervis did much of the active work in connection with the Licensed Show in the Garden last November in addition to his numerous other duties, which are usually more than sufficient to occupy all his time. During his absence, John C. Wetmore and Mr. Jervis' secretary, E. F. Korbel, will look after his interests.